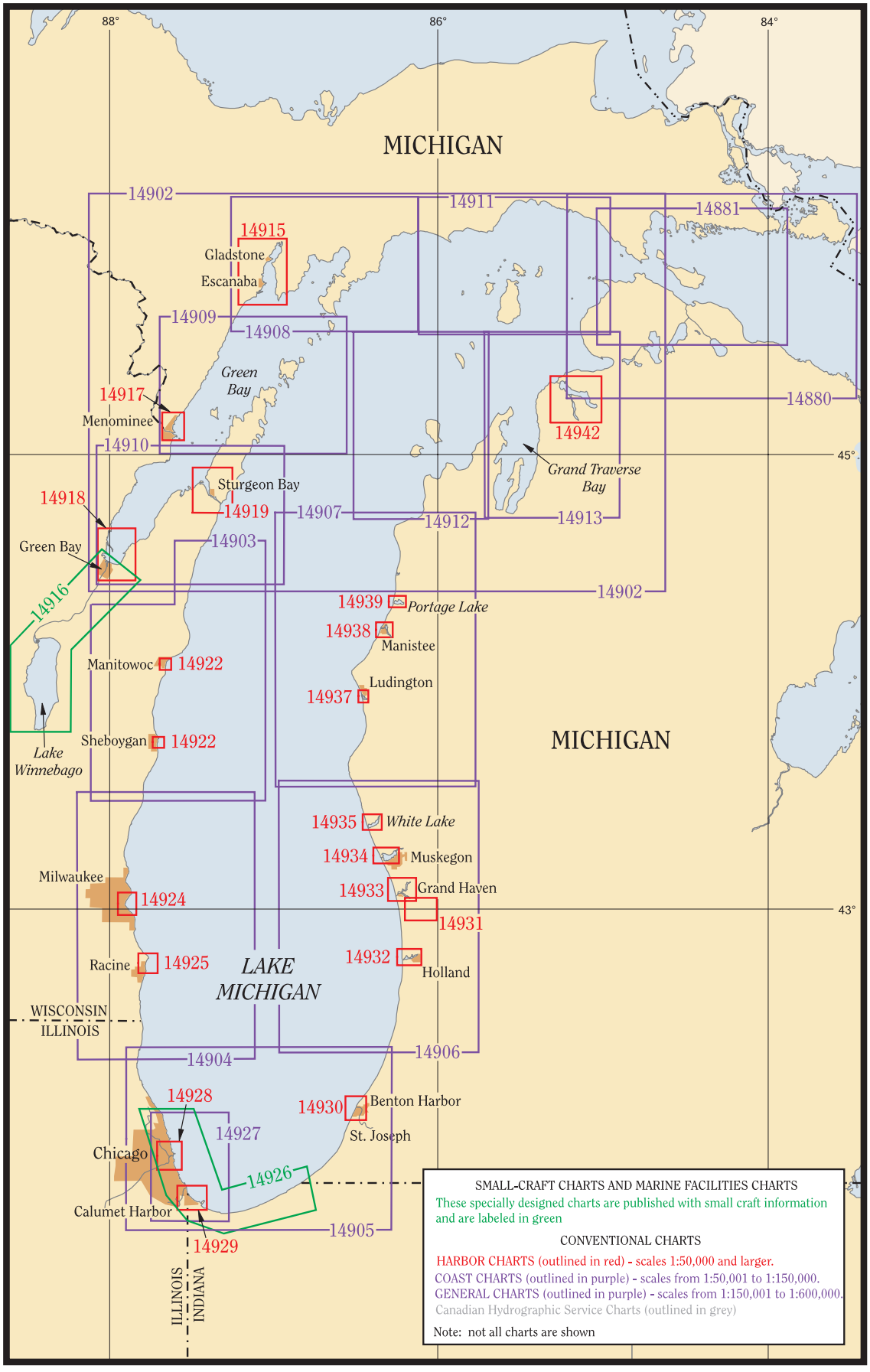
88°
86°
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MICHIGAN
14902
14911
14881
14915
Gladstone
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14909
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Green Bay
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Menominee
14910
14880
14942
Grand Traverse Bay
14918
Sturgeon Bay
14919
14907
14912
14913
Green Bay
14903
14916
14902
14939
Portage Lake
14938
Manistee
Manitowoc
14922
Ludington
14937
MICHIGAN
Sheboygan
14922
Lake Winnebago
14935
White Lake
14934
Muskegon
Milwaukee
14933
Grand Haven
14924
14931
Racine
14925
LAKE MICHIGAN
14932
Holland
WISCONSIN
ILLINOIS
14904
14906
14928
14930
Benton Harbor
14927
St. Joseph
Chicago
14926
Calumet Harbor
14905
14929
ILLINOIS
INDIANA
SMALL-CRAFT CHARTS AND MARINE FACILITIES CHARTS
These specially designed charts are published with small craft information and are labeled in green
CONVENTIONAL CHARTS
HARBOR CHARTS (outlined in red) - scales 1:50,000 and larger.
COAST CHARTS (outlined in purple) - scales from 1:50,001 to 1:150,000.
GENERAL CHARTS (outlined in purple) - scales from 1:150,001 to 1:600,000.
Canadian Hydrographic Service Charts (outlined in grey)
Note: not all charts are shown

Lake Michigan

Chart Datum, Lake Michigan

(1) Depths and vertical clearances under overhead cables and bridges given in this chapter are referred to Low Water Datum, which for Lake Michigan is an elevation 577.5 feet (176.0 meters) above mean water level at Rimouski, Quebec, on International Great Lakes Datum 1985 (IGLD 1985). (See Chart Datum, Great Lakes System, indexed as such, chapter 1.)

Dimensions, etc.

(2) Length, steamer track, Chicago to Straits of Mackinac; 321 miles.

(3) Length (right line), from about longitude 87°30'W. at the S end to 85°45'W. at the N end; 307 miles.

(4) Breadth (right line), on about latitude 45°25'N.; 118 miles.

(5) Depth, maximum recorded by NOS; 923 feet.

(6) Water surface of lake (including Green Bay); 22,300 square miles.

(7) Entire drainage basin (including Green Bay); 67,900 square miles.

General description

(8) **Lake Michigan** is the third largest of the Great Lakes and is the only one entirely within the United States. The only natural outlet of the lake is at the N end through the Straits of Mackinac. At the S end of the lake, the Illinois Waterway provides a connection to the Mississippi River and the Gulf of Mexico. The N part of the lake has many islands and is indented by several bays; Green Bay and Grand Traverse Bay are the largest. The shores in the S part of the lake are regular, and it has been necessary to construct artificial harbors. The forested shores in the N part of the lake are sparsely populated, while those in the S part are near the heart of the great urban industrial area of the U.S. Midwest.

Fluctuations of water level

(9) The normal elevation of the lake surface varies irregularly from year to year. During the course of each year, the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter and the highest during the summer.

(10) In addition to the normal seasonal fluctuations, oscillations of irregular amount and duration are also produced by storms. Winds and barometric pressure changes that accompany squalls can produce fluctuations that last from a few minutes to a few hours. At other times, strong winds of sustained speed and direction can produce fluctuations that last a few hours or a day. These winds drive forward a greater volume of surface water than can be carried off by the lower return currents, thus raising the water level on the lee shore and lowering it on the windward shore. This effect is more pronounced in bays and at the extremities of the lake, where the impelled water is concentrated in a small space by converging shores, especially if coupled with a gradually sloping inshore bottom which even further reduces the flow of the lower return currents. This condition is very pronounced at Green Bay Harbor.

Weather, Lake Michigan

(11) Rough water is created when strong winds blow over a long fetch of water. Northerly winds cause this on the S part of the lake and southerly winds have the same effect on the N part of the lake. They raise dangerous seas and generate hazardous currents at harbor entrances. Winds with southerly components are prevalent during the entire navigation season. Northerlies are a little less frequent, but are common, particularly in spring. The sea conditions are worst in October and November, when, lakewide, wave heights of 5 to 10 feet (2 to 3 m) are encountered about 35 percent of the time. In October, S through SW winds are most often responsible, while by November W through N winds often generate rough seas. Seas of 10 feet (3 m) or more are encountered 3 to 5 percent of the time from November through March. Extreme waves of 20 to 22 feet (6 to 7 m) have been encountered. During the spring, high seas are infrequent, but 5- to 10-foot (2 to 3 m) seas develop 15 to 30 percent of the time in the S and 20 to 40 percent in the N. Summer seas climb above 10 feet (3 m) less than 1 percent of the time, while those in the 5- to 10-foot (2 to 3 m) category drop to less than 20 percent in June and July. By August, the fall buildup begins.

(12) Gales are most likely from September through April, particularly in the fall. During this season gales

blow 3 to 7 percent of the time; speeds of 28 knots or more occur from 12 to 20 percent of the time. Strong winds often blow out of the W and NW, making E shore harbor entrances dangerous. The strongest measured over-the-lake wind was out of the WSW at 58 knots. However, since Green Bay recorded a 70-knot southwesterly gust in May 1989, it is not unrealistic to expect a wind extreme of 70 knots or more over open waters. Spring winds can still blow strong, with winds of 28 knots or more encountered about 4 to 8 percent of the time. They do slacken from their winter fierceness, with southerlies and southwesterlies becoming more frequent and northerlies less so as summer approaches. Strong winds are infrequent in summer and mostly associated with thunderstorms. S and SW winds prevail particularly in the N; southeasterlies are also common in the S. Northerlies are a secondary wind.

(13) Coastal winds are more localized and variable. Along the Michigan shore, spring winds are variable, particularly in the morning, when northerlies, easterlies, and southerlies are among the most common. By afternoon, aided by a lake-breeze effect, there are a preponderance of winds out of the S, particularly with the approach of summer. Summer also brings a slackening of windspeeds. The likelihood of encountering winds of 28 knots or more falls from a 4- to 10-percent chance in March to less than 3 percent by May. The most likely cause of strong winds in spring and summer are thunderstorm gusts. By summer, windspeeds of 28 knots or more occur less than 4 percent of the time and less than 2 percent most of the time. Summer winds along the shore are usually out of the E through S during the morning hours, swinging to the S and NW by afternoon, with an increase in speed. By October, there is a noticeable increase in windspeeds. Speeds of 28 knots or more increase to 4 to 6 percent. By December, these speeds can be encountered up to 11 percent of the time. Morning directions are variable, with E, S, and W winds among the most common. Afternoon winds are most often out of the S through W. The strong winds continue throughout the winter and are associated with winter storms, which bring a variety of winds from SW through NE.

(14) Along the W shore of the lake, spring winds are variable, but the influence of the land-lake breeze is already noticeable. Morning winds often have a westerly component, while an easterly influence is evident during the afternoon. Wind strength gradually abates during spring; by May, winds of 28 knots or more are encountered less than 1 percent of the time. Except for occasional thunderstorm gusts, summer winds rarely exceed 28 knots through September. Morning breezes are generally out of the S through W. During the day, they strengthen slightly and blow out of the NE through SE; SW and W winds are also common during the afternoon, when the prevailing circulation interferes with the lake-breeze effect. With autumn comes an increase in strength and less diurnal variability. By November, winds of 28 knots or more are encountered about 1 percent of the time. Fall winds blow mainly out of the S through NW, with SW and W winds the most frequent. During winter, westerlies and northwesterlies are common, but unseemingly, winds of 28 knots or more are no more frequent than in fall.

(15) While thunderstorms can occur at any time, they are most likely from May through September. During this period, thunder is heard on an average of 4 to 8 days per month at locations along the shore and 1 to 3 percent of the time over open water. Activity is a little more numerous in the S than the N. Over open water, July and August are the peak months, while June and July are more active along the shore. During the summer, a cool dome of air, the result of the lake breeze, often blocks thunderstorms and squall lines during the day. This results in a nighttime peak in activity. However, a severe squall line may break through this block, or due to a strong prevailing circulation, the block may not exist.

(16) In spring, when there is often a clash between cold and warm air, thunderstorms and squall lines can be violent. On occasion they may trigger tornadoes or even waterspouts. This area lies at the NE edge of the nation's maximum frequency belt for tornadoes. Although rare, tornadoes are most likely from April through June.

(17) Poor visibilities, caused by fog, rain, snow, and pollution, may occur in any season. Fog is the principal cause of visibilities less than 0.5 statute mile (0.4 nm). It is most likely in the spring and early summer over open water (advection fog) and from late fall through spring along the shore (radiation fog).

(18) In open waters, from March in the S and April in the N through June, warm moist air riding winds with a southerly component blowing at 5 to 20 knots reduces visibilities to less than 0.5 statute mile (0.4 nm) from 5 to 10 percent of the time. These fogs are most likely during the morning and early afternoon and when the air is 5° to 15°F (3° to 8°C) warmer than the water. May and June are the most likely months.

(19) The shores of Lake Michigan are subject to varying amounts of fog. Upwelling along the NW shores increases the possibility of advection fog in spring and summer; in fact, the W shore waters in general are 5 to 10°F (3° to 6°C) cooler than the E shore waters. N of Chicago, visibilities drop to less than 0.5 statute mile (0.4 nm) on about 25 to 35 days annually. In the Chicago area, smoke and haze frequently reduce visibility

to the 3- to 6-mile (2.6 to 5.2 nm) range, but dense fog is less common than it is to the N. It is most likely from fall through late spring with a minimum in July. Along the Michigan shore, the indication from the few locations with fog observations is that frequencies are similar to those along the Wisconsin shore. In comparing Muskegon to Milwaukee, both exhibit a morning maximum from April through October, early morning in the summer and around sunrise in other seasons. The most fog-free times occur during the afternoon in spring and late morning through evening in summer. Milwaukee is more fog prone in spring, but less in summer and fall. Overall, Muskegon averages 5 fewer days annually with visibilities less than 0.5 statute mile (0.4 nm).

Ice

(20) The first waters to form an extensive ice cover are Green Bay and the Bays de Noc. The Straits of Mackinac and the shallow areas N of Beaver Island usually follow. The Straits are usually closed by mid-December. (See the discussion of ice in the Straits of Mackinac in chapter 10.) These buildups are aided by windrows resulting from prevailing winds and currents. In a normal winter, an early ice cover is established by the end of January and includes the above-mentioned waters plus the extreme S part of the lake. In general, ice accumulates in a southerly direction with a rapid buildup in the shallows E of Manitou and Fox Islands. In this area, the prevailing NW wind traps ice between the land masses and, with the exception of Grand and Little Traverse Bays which are solid, vessels can expect to encounter drifting ice. The surface features and location of the ice fields change as a direct function of the wind. Shores exposed to the full force of the wind often have large ice fields of very heavy brash extending 1 to 2 miles offshore. In addition, a circular current pattern in the S part of the lake distributes drifting floes along the shore. Even during a mild winter, these floes can build out 10 to 15 miles into the lake. A mild winter on Lake Michigan means about 10-percent coverage compared to an average 40-percent coverage and an 80-percent coverage during a severe winter. Maximum ice coverage occurs by mid-March, on the average, while decay begins a week or two later. By mid-April, ships are once again transiting the Straits of Mackinac.

Routes

(21) The Lake Carriers' Association and the Canadian Shipowners Association have recommended, for vessels enrolled in the associations, the following separation of routes for upbound and downbound traffic in Lake Michigan:

(22) Southbound vessels, bound for Milwaukee and W shore points N thereof shall run out on a course of **241°** for 30 miles from a point of departure abreast of Lansing Shoals on course to Rock Island Passage then steer **205°** for 202.5 miles to Milwaukee, or other courses to destination.

(23) Southbound vessels, bound for W shore points S of Milwaukee shall run out on a course of **241°** for 30 miles from a point of departure abreast of Lansing Shoals on course to Rock Island Passage; then steer **196°** for 208 miles to a point E of Wind Point to intersect the regular southbound track; vessels bound for Calumet or Indiana Harbor steer **188°** for 69.5 miles; vessels bound for Buffington or Gary steer **183°** for 73.6 miles; vessels bound for Burns Harbor change course 19.7 miles prior to reaching the point E of Wind Point and steer **180°** for 96.75 miles.

(24) Southbound vessels from Sturgeon Bay bound for ports near the S end of Lake Michigan shall lay a course of **172°** for 47.5 miles to a point 19 miles **114.75°** from Rawley Point Light.

(25) Southbound vessels from Porte Des Morts Passage bound for the S end of Lake Michigan shall lay a course of **189°** for 79.5 miles to a point 19 miles **114.75°** from **Rawley Point Light**.

(26) From the point 19 miles E of Rawley Point Light vessels shall steer **183°** for 165.25 miles to Buffington or Gary, or when **090°** from **Wind Point Light** vessels can change course to **188°** for 69.5 miles to Calumet or Indiana Harbor.

(27) Southbound vessels from the Straits of Mackinac bound for E shore points may use the Grays Reef Passage or the northbound course by Lansing Shoals. If they choose to use the Grays Reef Passage they shall lay a course from the Mackinac Bridge, steering **275°** until abeam of **New Shoal Lighted Buoy 1** when change is made to **260°**. Steer **260°** until turning to the **186°** course through Grays Reef with White Shoal bearing **006°**.

(28) From Grays Reef, take departure from Grays Reef Passage steering **237°** and haul to **217°** when abeam **Ile Aux Galets Light**. Then when abeam Leland Light, change course to **197°** until abeam **North Manitou Shoals Light** when haul is made to **242°** for about 13.25 miles for Sleeping Bear.

(29) When abeam **Sleeping Bear Lighted Bell Buoy 7**, steer **205°** for 17.5 miles to a point 3.75 miles W of Point Betsie Light; then steer **195°** for 45.25 miles to a point 3 miles W of **Big Sable Light**; then steer **183°** for 28 miles to a point 3 miles W of Little Sable Light; thence to destination.

(30) Northbound vessels for the Straits of Mackinac will navigate via Manitou Passage. This rule does not apply to vessels coming out of Green Bay. Vessels from

Southern Lake Michigan set a course for a point 4.75 miles abreast of Big Sable. These courses and distances are: from Burns Harbor **009°** for 169.5 miles; from Gary and Buffington **012°** for 168 miles; from Calumet and Indiana Harbor **015°** for 163.75 miles, and from Chicago **017°** for 158 miles; then, from abreast Big Sable, steer **015°** for 44 miles until 5.75 miles from **Point Betsie Light**; then steer **029°** for 17.5 miles until abreast of Sleeping Bear Lighted Bell Buoy 7; then steer **062°** for 14.5 miles until abreast of **North Manitou Shoal Light**; then **037°** for 64.75 miles to Grays Reef.

(31) Vessels eastbound out of St. Martin and Rock Island Passages shall set a course to pass not more than 6 miles off Seul Choix Point. Taking departure from **Rock Island Passage Lighted Gong Buoy RI** the course is **056°** for 58 miles.

(32) Vessels northbound from ports near the S end of Lake Michigan to Escanaba shall set course for not more than 8 miles off Wind Point. Vessels from Gary and Buffington steer **350°** for 75.75 miles; vessels from Calumet and Indiana Harbor steer **354°** for 69 miles. Then steer **006°** for 98.75 miles to a point not more than 5 miles off Rawley Point; then steer **020°** for 75.25 miles to Porte Des Morts Entrance Lighted Bell Buoy. Northbound vessels to Port Inland from near the S end of Lake Michigan shall follow the northbound Manitou course to a point 5.75 miles abreast Point Betsie; then steer **013°** for 63.5 miles to a point 4 miles W of Boulder Reef; then steer **022°** for 23.75 miles to **Port Inland Lighted Bell Buoy 2**; then steer **000°** 4 miles to destination.

(33) It is understood that masters may exercise discretion in departing from these courses when ice and weather conditions are such as to warrant it. The recommended courses are shown on charts No. 14900 and 14901, Lake Michigan.

Pilotage

(34) The waters of Lake Michigan are Great Lakes undesignated waters; registered vessels of the United States and foreign vessels are required to have in their service a United States or Canadian registered pilot or other officer qualified for Great Lakes undesignated waters. Registered pilots for Lake Michigan are supplied by Western Great Lakes Pilots Association (See Appendix A for addresses.) Pilot exchange points are off Port Huron at the head of St. Clair River in about 43°05'30"N., 82°24'42"W. and at De Tour, Mich., at the entrance to St. Marys River. Three pilot boats are at Port Huron; HURON BELLE has an international orange hull with an aluminum cabin, and HURON MAID and HURON LADY each have an international orange hull with a white cabin. The pilot boat at De Tour, LINDA JEAN, has a green hull and a white cabin. (See Pilotage, chapter 3, and **46 CFR 401,** chapter 2.)

Principal ports

(35) Most of the harbors on the E side of Lake Michigan are within the mouths of small rivers or in small lakes connected to Lake Michigan by an entrance channel. Parallel piers have been constructed at the mouths of these harbors to aid in carrying the bar into deeper water and to lessen the need for dredging in the harbor entrance. In addition, several harbors along this shore have been provided with stilling basins formed by breakwaters that converge to an entrance opening in deep water beyond the parallel piers. These basins dissipate the force of storm generated waves to prevent them from being conducted through the confined channels between the piers and into the harbors.

(36) The harbors on the W side of the lake are generally at the mouths of small rivers, the only large streams being the Fox and Menominee Rivers which empty into Green Bay. The entrances to the harbors are generally protected by parallel piers, and some have been provided with stilling basins. Some harbor entrances are protected by detached breakwaters. Outer harbors enclosed by breakwaters have been constructed at Calumet Harbor and Milwaukee. Entirely artificial harbors, with basins enclosed by piers and breakwaters, are at Burns International Harbor, Gary, Buffington, Indiana Harbor, Great Lakes, Waukegan, Port Washington, and Port Inland.

(37) The most important harbors in Lake Michigan are Muskegon, Calumet, Chicago, Milwaukee, Kenosha, and Green Bay. Drydocking facilities for deep-draft vessels are at Sturgeon Bay.

Charts 14880, 14881, 14902

(38) **Old Mackinac Point** (45°47.3'N., 84°43.8'W.), the northeasternmost point of the lower peninsula of the State of Michigan, is on the S side of the narrowest part of the Straits of Mackinac at the entrance to Lake Michigan. The point is marked by an abandoned lighthouse.

(39) **Mackinac Bridge** crosses the Straits of Mackinac between Mackinaw City and St. Ignace to connect the upper and lower Michigan peninsulas. The center span of the suspension bridge is 3,000 feet wide with a vertical clearance of 148 feet at the center decreasing to 135 feet at each end. The N and S suspension spans are each 1,720 feet wide with clearances of 129 feet decreasing to 86 feet at the shoreward ends. Between each of these spans and the adjacent cable anchor piers, fixed spans have clearances of 86 feet decreasing to 52 feet at the

anchors. The S bridge approach has 16 fixed spans with clearances of 75 to 20 feet. The N bridge approach has 12 fixed spans with clearances of 75 to 20 feet.

(40) The lake approaches to the center suspension span are marked by lighted and unlighted buoys. A private fog signal is under the center span on the channel line. Obstructions covered 32 and 27 feet are S of the buoyed channel on the E side of the bridge in about 45°48'05.8"N., 84°43'20.0"W., and 45°48'15.8"N., 84°43'15.5"W., respectively. The least depth N of the buoyed channel is 23 feet.

(41) Between Old Mackinac Point and **McGulpin Point,** the northernmost point of the lower peninsula of the State of Michigan, 1.8 miles W, a small bight has shallow water extending about 0.8 mile offshore. McGulpin Point is deep-to. Between McGulpin Point and Waugoshance Point, 11.5 miles W, the shore is indented by three shallow bays. The wide unnamed bay just SW of McGulpin Point has depths less than 15 feet extending 1.5 miles from its head. It affords protection in NE to SW winds. **Cecil Bay,** just W, has shallows extending 0.5 mile from shore. From the E point of the bay a very shallow bank extends 0.4 mile NW. A detached 19-foot spot is 1.1 miles N of this point. **Big Stone Bay,** just W of Cecil Bay, has deep water within 0.3 mile of its head. W from Big Stone Bay the shoal border increases to a width of about 2 miles abreast the outer end of Waugoshance Point.

Charts 14880, 14902, 14911

(42) **Waugoshance Point** (45°45.5'N., 85°00.6'W.) is a narrow strip of land jutting 2 miles W from the shoreline. Very shallow waters, rocks awash, and a group of small islands extend 3.5 miles W from the extremity of the point to just beyond **Waugoshance Island.** This area is the outcropping of an extensive bank that reaches 1.2 miles W and about 2 miles NW from Waugoshance Island. The bank, with depths of 3 to 8 feet at the outer end, is marked near the NW extent by an abandoned lighthouse. Protective riprap extends 25 feet from the base of the structure. The shoals N and W of the lighthouse, Grays Reef Passage, and the islands and shoals of the Beaver Island group will be described later.

(43) **Sturgeon Bay** is a broad bay open to the W between Waugoshance Point on the N and **Sturgeon Bay Point** on the S. The N part of the bay is filled with a shallow flat over rock bottom. A shoal with depths less than 6 feet extends 0.5 mile NW from Sturgeon Bay Point.

Chart 14880

(44) From Sturgeon Bay Point, the shore extends S and then rounds SW for about 16 miles to **Sevenmile Point** (45°28.7'N., 85°05.5'W.). The shoal border in this stretch is generally less than 0.7 mile wide, except in the vicinity of Cross Village where the 24-foot contour is 1.2 miles offshore.

(45) **Cross Village, Mich.,** is about 8 miles S of Waugoshance Point and 2 miles S of Sturgeon Bay Point. In 1978, the former small-craft basin had partially filled with sand and gravel, and the breakwater was in ruins. No shelter is available at Cross Village.

Charts 14880, 14902, 14913

(46) **Little Traverse Bay** indents the E shore of Lake Michigan between Sevenmile Point and **Big Rock Point** (45°21.7'N., 85°12.1'W.). The bay is about 10 miles wide at the entrance, narrowing to 2 miles wide at its head, 11.5 miles E. The bay, with deep water and good holding ground, provides protection in all but W winds. Shoals extend about 0.5 mile off the NW shore and the head of the bay, but otherwise the shores are generally deep-to.

(47) **Harbor Point** is a narrow spit that extends SE from the N shore of Little Traverse Bay to protect the harbor at Harbor Springs. **Little Traverse Light** (45°25.2'N., 84°58.6'W.), 72 feet above the water, is shown from a white skeleton tower on the end of the point.

(48) **Harbor Springs, Mich.,** on the N shore of Little Traverse Bay, is a fine small-craft harbor of refuge affording security in any weather. On the N shore of the harbor, docks extend to 10 to 12 feet of water, with 16 feet at the end of the city dock.

Harbor regulations

(49) **Local harbor regulations** are established by the Harbor Springs City Council and are enforced by the **harbormaster.** A **slow-no wake speed** is enforced within the limits of the harbor. Copies of the regulations may be obtained from the Harbormaster, City of Harbor Springs, 349 East Main Street, Harbor Springs, Mich. 49740.

(50) A **special anchorage** area, marked by lighted buoys, is on the N side of the harbor. (See **110.1 and 110.82a,** chapter 2, for limits and regulations.)

Small-craft facilities

(51) A municipal marina constructed by the Michigan State Waterways Commission and the city, and private marinas provide transient berths, gasoline, diesel fuel, water, ice, electricity, marine supplies, sewage pump-out, launch ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 50 tons and a marine railway for craft to 75 feet long are available for all types of marine repairs.

(52) The W terminus of the Inland Route, which connects Crooked Lake, Crooked River, Burt Lake, Indian River, and Mullett Lake to the Cheboygan River and Lake Huron, is about 2.5 miles E of the head of Little Traverse Bay. There is no navigable connection from Lake Michigan to the Inland Route, but an overland portage service is available for trailerable craft to 25 feet and 5,000 pounds. (For complete information see Inland Route, chapter 10.)

(53) **Petoskey, Mich.,** is on the S side near the head of Little Traverse Bay. A small-craft harbor at Petoskey is protected on the W by a breakwater extending N from shore and marked on the outer end by a light. The breakwater should not be passed close aboard due to large riprap stones along the sides, and end. In 2002, reported depths in the harbor were 9 feet along the outer ends of the municipal piers, thence 7.5 feet in the NE basin and 6.4 feet in the SW basin.

(54) Anchorage ground in the harbor is poor, being stony bottom.

(55) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(56) The municipal marina constructed by the city and the Michigan State Waterways Commission on the SE side of the harbor provides transient berths, gasoline, water, electricity, sewage pump-out, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

(57) From Big Rock Point, the shore trends SW for about 4 miles to Charlevoix. Deep water is about 0.4 mile offshore in this stretch.

Charts 14913, 14942

(58) **Charlevoix, Mich.**, is a city and harbor at the mouth of **Pine River,** about midway of the rounding shore between Little Traverse Bay and Grand Traverse Bay.

Channels

(59) A dredged entrance channel leads SE from Lake Michigan between parallel piers through the lower portion of Pine River to Round Lake, the harbor proper of

Charlevoix. The outer ends of the piers are marked by lights. From the E end of Round Lake, a dredged channel leads SE through the upper portion of Pine River to Lake Charlevoix, entered about 1 mile distant from the Lake Michigan shoreline. Mooring to the Government piers or revetments is prohibited.

(60) In May 2006, the controlling depths were 17.6 feet in the entrance channel to Round Lake (except for shoaling to 15.5 feet along the S edge of the entrance channel just off the end of S pier), thence 15.8 feet in the dredged channel from Round Lake to Lake Charlevoix.

(61) **Round Lake,** about 0.4 mile in diameter, has depths to 60 feet, with deep water generally close to shore. The lake has good anchorage.

Anchorages

(62) A special anchorage, marked by buoys in the N part of Round Lake, has good holding ground, sand and gravel bottom. (See **33 CFR 110.1 and 110.82,** chapter 2, for limits and regulations.)

Bridges

(63) Bridge Street (U.S. Route 31) bridge crosses Pine River just below Round Lake. The bridge has a bascule span with a clearance of 16 feet. (See **33 CFR 117.1 through 117.59 and 117.641,** chapter 2, for drawbridge regulations.)

Currents

(64) Currents in Pine River are reported to reverse twice daily with a velocity up to 3 mph. At times they may reach a velocity up to 5 mph.

Coast Guard

(65) **Charlevoix Coast Guard Station** is on the N side of the Pine River entrance to Lake Charlevoix.

Harbor regulations

(66) Federal regulations specify a **speed limit** of 8 mph (7 knots) in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations have been established by the city of Charlevoix and are enforced by the **harbormaster.** A **slow-no wake speed** is enforced. Copies of regulations may be obtained from the Chief of Police, City Hall, 210 State Street, Charlevoix, Mich. 49720.

Small-craft facilities

(67) A marina, developed by the Michigan State Waterways Commission and operated by the city, is on the W side of Round Lake. Transient berths, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 20 tons are available for hull and engine repairs. Gasoline and diesel fuel are available at a fuel dock in the SW corner of the lake, adjacent to the municipal marina.

Ferry

(68) Ferry service is available between Charlevoix and St. James Harbor on Beaver Island from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is on the W shore of Round Lake about 300 feet SE of the U.S. Highway 31 bridge.

(69) **Lake Charlevoix** extends about 14 miles SE from the head of Pine River and is from 1 to 2 miles wide, with depths to over 100 feet and deep water generally close to shore. **Boyne City, MI,** is at the SE end of the lake.

(70) A municipal marina at Boyne City provides transient berths, water, ice, electricity, sewage pump-out, and a launching ramp. At **Advance, Mich.,** about 2.5 miles W of Boyne City, the Wolverine Power Supply Cooperative has a coal dock providing 630 feet of berthing space with dolphins, a deck height of 11 feet, and a depth of 25 to 30 feet alongside. About 5 miles from the NW end of Lake Charlevoix, **South Arm** extends 9 miles S from **Ironton** at the N end to **East Jordan** at the S end. A marina developed by the Michigan State Waterways Commission at East Jordan provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

(71) A **slow-no wake speed** is enforced in the narrows of South Arm opposite Ironton. (See Small-craft Regulations, State of Michigan, chapter 3.)

Cable Ferry

(72) A cable ferry crosses South Arm at Ironton. The self-propelled ferry is guided across the 600-foot-wide channel by two cables which are anchored ashore and pass along each side of the ferry at deck level. The cables are at a depth of about 20 feet at midchannel when the ferry is docked on either shore. When the ferry is at midchannel, the cables are at their least depths. The ferry should not be passed within about 200 feet when docked at either shore. **DO NOT ATTEMPT TO PASS A MOVING CABLE FERRY.**

(73) From Charlevoix W for 1.8 miles to **South Point** (45°19.3'N., 85°18.0'W.), shoals extend about 0.25 mile offshore. A lighted bell buoy marks the N extent of the shoals off South Point.

(74) The Medusa Cement Co. has a facility for shipping cement and receiving coal on the E side of South Point about 1.5 miles W of Charlevoix. Lighted loading

silos and the tallest stack (45°19'01.5"N., 85°18'00.8"W.) at the facility are prominent. A breakwater formed by two sunken barges extends about 1,600 feet lakeward from the shore and affords protection for the privately dredged channel along its S side and for the loading slip at its inner end. A private light marks the outer end of the breakwater. The entrance channel and slip are reported to be dredged to 24 feet annually. The slip is about 100 feet wide. The N side, 645 feet long, is used to ship cement. The S side, 556 feet long, is used to receive coal for plant consumption. The docks have a deck height of 10 feet, and there is silo storage for 120,000 tons of cement. Six spouts can load vessels at 3,000 tons per hour.

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(75) **Fisherman Island**, about 4 miles SW of South Point, is on the NE side of the entrance to Grand Traverse Bay. The island is on a stony bank that extends about 1 mile NW from shore with depths of 6 to 9 feet at the outer edge. A buoy marks the extent of the bank.

(76) **Grand Traverse Bay,** separated from Lake Michigan by the **Leelanau Peninsula,** extends S from the lake for about 32 miles and is about 10 miles wide. The upper 17 miles of the bay are divided into **East Arm** and **West Arm** by a narrow peninsula that extends N and terminates in Old Mission Point. The shores of Grand Traverse Bay are generally hilly and wooded.

(77) The E shore of Grand Traverse Bay, from Fisherman Island to the S end of East Arm, is bordered by shoals, rocky spots, and ledges, and should not be approached closer than 1 mile. A shoal with a least depth of 15 feet is 2.8 miles off the E shore of the bay 11.5 miles S of Fisherman Island. A lighted bell buoy marks the W side of the shoal.

(78) **Elk Rapids, Mich.,** is a village and small-craft harbor on the E shore of the bay about 12 miles from the head of East Arm at the mouth of **Elk River.** The harbor is entered through an entrance channel that leads S from the bay between two breakwaters to a basin at the river mouth. The outer ends of the breakwaters are marked by private lights, and the channel is marked by private buoys and a private leading light on the point inside the breakwaters. The entrance channel has been privately dredged to a depth of about 5½ feet.

(79) A marina developed by the Michigan State Waterways Commission in the harbor provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

(80) At **Deepwater Point,** on the E shore about 3 miles from the head of the East Arm, there are piles formerly used for mooring self-unloading coal vessels. **Cuttysark Harbor,** 1.2 miles S of Deepwater Point, has a marina which provides transient berths, gasoline, diesel fuel, water, electricity, and sewage pump-out. The outer ends of the breakwaters are marked by private lights. A shallow flat, with depths less than 18 feet, extends 1.3 miles from the head of East Arm.

(81) **Elk Lake, Lake Skegemog, Torch Lake, Clam Lake, Bellaire Lake,** and their connecting waters are adjacent to and generally parallel the E shore of East Arm. These waterways are used by small craft, but there is no navigable outlet from any of these lakes to Grand Traverse Bay.

(82) Lake Skegemog, opening from the SE side of Elk Lake, is about 3.5 miles long and 1.3 miles wide. From it the Torch River extends about 2 miles N to Torch Lake, about 18 miles long N and S with a width of from 1 to 2 miles. From the E side of Torch Lake at Clam River, about 6 miles from its S end, a passage leads E through Clam Lake, and thence N into Bellaire Lake. From the E side of Bellaire Lake, a channel extends N about 2.5 miles to Intermediate Lake, but at the town of Bellaire, about 1.5 miles from Bellaire Lake, a dam across the stream bars passage through to Intermediate Lake.

(83) A **slow-no wake speed** is enforced on Torch River and the adjacent waters of Torch Lake for 300 feet, on Clam River from Torch Lake to Clam Lake, on Grass River from Clam Lake to Lake Bellaire, and on Intermediate River from Lake Bellaire to Intermediate Lake.

(84) The W shore of East Arm may be approached within 0.3 mile except in the upper 2.5 miles where shoals extend 0.5 mile offshore. **Old Mission Harbor,** 2.5 miles S of Old Mission Point, affords good shelter in winds from SW through N to E. Deep water is within 0.1 mile of the head of the bay and the NE shore. Shoals extend 0.25 mile off the SW shore, and a shoal extends about 0.3 mile SE from the E point of the bay. In 1983, a submerged obstruction was reported to be SE of Old Mission Harbor in about 44°57'30.7"N., 85°28'24.5"W. to Old Mission Point, shoals extend 0.3 mile off. At **Old Mission Point** (44°59.5'N., 85°28.8'W.), marked by an abandoned lighthouse, a shoal bank, with depths less than 12 feet near the outer edge, extends 1.5 miles N and W. The bank should not be navigated, even by small craft.

(85) **Mission Point Light,** on a detached shoal 2 miles NW of Old Mission Point, is a guide into the East and West Arms of Grand Traverse Bay. A small rocky ledge, covered 22 feet, is 1.7 miles NE of the light.

(86) From Old Mission Point, the E shore of West Arm extends 2 miles SW to **Merril Point,** thence 6 miles S to **Tucker Point** (44°53.4'N., 85°33.5'W.). Along this stretch, the shoal border gradually widens from 0.2 mile to 0.75 mile, just N of Tucker Point. A shoal, with several bare spots, extends 0.4 mile S from Tucker Point; the S extent of the shoal is marked by a buoy.

(87) **Bowers Harbor,** enclosed on the W by Tucker Point, provides secure anchorage with shelter from all but SW winds. A marina on the NE side provides transient berths, gasoline, water, electricity, a launching ramp, and limited hull and engine repairs to trailerable craft. **Marion Island** is off the mouth of Bowers Harbor, 1.3 miles SW of Tucker Point. Shoals extend 0.4 mile N and 0.9 mile SW from the island. Buoys mark the NE and SW extent of the shoals. A wreck, covered 32 feet, is just N of the buoy marking the SW shoal.

(88) The E shore of West Arm, from Bowers Harbor to the head at Traverse City, is clear to within 0.25 mile.

(89) **Traverse City, Mich.,** at the head of West Arm, is the principal harbor on Grand Traverse Bay. Prominent are the stacks of the city powerplant and the Park Place cupola, about 2,400 feet SE of the powerplant. The principal cargoes handled in the port are petroleum products and coal. Good anchorage is available off the city.

(90) The **Great Lakes Maritime Academy** of Northwestern Michigan College is in Traverse City, Mich. Maritime oriented courses, including seamanship, navigation, communication, and maritime law, prepare cadets for positions aboard Great Lakes ships. Further information may be obtained from The Dean of Admissions, Northwestern Michigan College, 1701 East Front Street, Traverse City, Mich. 49684.

Channels

(91) A dredged basin is on the W side of West Arm about 1.5 miles N of the city. The basin is formed by a breakwater extending S from shore on the E side and a detached breakwater on the S side. The outer ends of the breakwaters are marked by lights. In August 1982, the controlling depths were 12 feet in the S part of the basin and 10 feet in the N part except for shoaling to 5 feet along the E edge and 8 feet in the NE corner.

(92) **Boardman River** flows from **Boardman Lake** through Traverse City and empties into the head of West Arm. The mouth of the river is protected by parallel piers; the outer end of the W pier is marked by a private light. The river has depths of about 2 feet for 0.3 mile, thence 1 foot to a dam 1.2 miles above the mouth. Currents in the river are swift. Below the dam, the river is crossed by six fixed highway bridges with a minimum clear width of 10 feet and a minimum clearance of 5 feet.

Coast Guard

(93) **Traverse City Coast Guard Air Station**, is about 2 miles SE of the mouth of Boardman River. The air station supports Coast Guard surface operations, carries out search and rescue missions, and renders airborne assistance. The air station can be contacted on VHF-FM channel 16 or through the nearest Coast Guard station.

Harbor regulations

(94) Local harbor regulations are established and enforced by the **harbormaster** who can be reached at the Traverse City Police Department, 520 W. Front Street, Traverse City, Mich. 49684. Copies of the regulations can be obtained from the harbormaster.

Wharves

(95) Traverse City has three active deep-draft facilities. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(96) **Traverse City Coal Dock:** (44°47'11"N., 85°38'08"W.); 210-foot face; 18 feet alongside N end; deck height, 6 feet; vessels dock port side to; open storage for 16,000 tons of coal; receipt of coal and slag; owned and operated by city of Traverse City.

(97) **Naph-Sol Refining Co. Dock:** 0.2 mile S of Coal Dock; 300 feet of berthing space along dolphins; 32 feet alongside; tank storage for 7¼ million gallons; receipt of light oils; owned and operated by Naph-Sol Refining Co.

(98) **Total Petroleum, Inc. Dock:** 0.25 mile S of Coal Dock; 375 feet of berthing space along dolphins; 23 feet alongside; deck height, 10 feet; tank storage for about 10½ million gallons; receipt of petroleum products; owned and operated by Total Petroleum, Inc.

Small-craft facilities

(99) A public small-craft basin constructed by Traverse City and the Michigan State Waterways Commission is protected by breakwaters, about 2,800 feet W of the mouth of Boardman River. The basin is entered from the E between two breakwaters that are marked on the ends by private lights. Transient berths, gasoline, water, electricity, sewage pump-out, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9.

(100) A small-craft basin protected by breakwaters is at **Greilickville**, about 2 miles NW of the Traverse City docks. The outer ends of the breakwaters are marked by lights. A dredged channel leads N from deepwater in Grand Traverse Bay through the breakwaters to a mooring basin. In October 2005, the controlling depths were 13.8 feet in the entrance channel (except for lesser

depths to 8.5 feet along the E edge), thence 10 feet in the basin with shoaling to 4.9 feet along the E edge.

(101) A seasonal facility constructed by the city and the Michigan State Waterways Commission is on the W side of the basin and a private marina is at the N end of the basin. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, marine supplies, launch ramp, and harbormaster services are available. The harbormaster may be contacted during the boating season by calling 616-946-5463. At the private marina, a 30-ton mobile hoist is available for hull and engine repairs. In 1978, depths of 7 to 15 feet were reported alongside the docks, with 10 feet at the fuel pumps.

(102) N from Traverse City for 11 miles to **Lee Point** (44°55.5'N., 85°36.2'W.), shoals extend about 0.3 mile offshore, except at a point 2 miles N of Traverse City where a shoal with a least depth of 6 feet extends 0.5 mile offshore. The outer edge of the shoal is marked by a lighted buoy. The buoy is sometimes difficult to distinguish at night because of vehicle taillights on the shore highway. A shoal with depths of 7 to 18 feet extends 2.5 miles S from Lee Point. The S end is marked by a buoy. From Lee Point N for 5.5 miles to **Stony Point (Suttons Point),** shoals extend no more than 0.6 mile offshore. A lighted bell buoy 0.7 mile NE of Lee Point marks the outer edge of the shoal bank. A buoy marks the outer edge of the shoal that extends 0.3 mile N from Stony Point.

(103) The shore from Stony Point N to **Omena Point** has generally deep water within 0.4 mile. **Omena Bay,** behind Omena Point, has good water with secure anchorage and shelter from all winds from SW through N to E. Gasoline is available at a small marina at **Omena, Mich.,** at the head of Omena Bay. In 1978, a depth of 5 feet was reported alongside.

(104) **Suttons Bay** extends 2.5 miles SW from Grand Traverse Bay on the W side of Stony Point. The bay affords good anchorage with protection from all but NE winds. Shoals extend 0.2 mile from the E shore and head, and 0.4 mile from the W shore. **Suttons Bay, Mich.,** is a village on the W side of the head of the bay. A public small-craft facility constructed by the Michigan State Waterways Commission at the village provides transient berths, gasoline, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Limited repairs are available.

(105) **Northport Bay** is an indentation on the W side of Grand Traverse Bay between Omena Point and **Northport Point,** Shelter is available in the bay from all but SE winds, but the holding ground is poor, being either mud or rock. A shoal marked at the outer edge by a lighted bell buoy extends 0.5 mile SE from Northport Point. Shoals extend no more than 0.5 mile offshore in the bay, but there are several dangerous detached shoals in the bay. About 0.5 mile W of Northport Point, a shoal with rocks awash is about 1.2 miles long N and S. A buoy marks the S end of the shoal. A 3-foot shoal, marked on the S side by a buoy, is 1 mile W of Northport Point. **Bellow Island** is in the entrance to the bay, 2.4 miles S of Northport Point. Shoals extend about 0.3 mile off around the island. Two 14-foot spots are 1 mile N and a 17-foot spot is 0.6 mile NW of Bellow Island.

(106) **Northport, Mich.,** is a village and small-craft harbor on the W side of Northport Bay. A breakwater marked at the outer end by a private light protects a small-craft basin constructed by the village and the Michigan State Waterways Commission. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A marine railway for craft to 65 feet and 30 tons, and a mobile hoist for sailing craft to 42 feet, are available for hull and engine repairs about 1 mile N of the village.

(107) From Northport Point N to Lighthouse Point, deep water is generally within 0.5 mile of shore. An 18-foot spot is 1 mile offshore 4.3 miles NE of Northport Point. **Lighthouse Point** is the N end of the Leelanau Peninsula, which separates Grand Traverse Bay from Lake Michigan. Shoals extend 0.7 mile N from the point. **Grand Traverse Light** (45°12.6'N., 85°33.0'W.), 50 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on Lighthouse Point.

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(108) An extensive area of off-lying islands and shoals is in Lake Michigan from the vicinity of Waugoshance Point SW to Lighthouse Point.

(109) A group of shoals about 4 miles long E and W has its N limit about 3.5 miles N of Waugoshance Island along the S side of the vessel route between the Straits of Mackinac and Grays Reef Passage. **Rose Shoal,** the southernmost of the group, has a least depth of 11 feet 2.6 miles NNW of Waugoshance Island. Bordering the S side of the vessel route, **New Shoal No. 1,** the easternmost of the group, has a depth of 14 feet over boulders. **New Shoal No. 3,** the westernmost of the group, has a least depth of 16 feet. A lighted bell buoy at the NW end of the shoal marks the E side of the route through Grays Reef Passage. **New Shoal No. 2,** midway between the other two, has a least depth of 17 feet and is marked on the N side by a lighted buoy.

(110) **White Shoal,** 6.2 miles NW of Waugoshance Island, is about 2 miles long E and W. The W end of the shoal is awash. **White Shoal Light** (45°50.5'N., 85°08.1'W.), 125 feet above the water, is shown from a red and white spirally banded conical crib on the E end of the shoal. A fog signal and a radar beacon (Racon) are at the light. Riprap extends 25 feet from the base of the light and it should not be passed close aboard even by shallow-draft vessels. A buoy marks the W end of White Shoal. An 18-foot shoal is 0.8 mile NW of the buoy, and several shoal spots with depths of 20 to 30 feet are close around White Shoal.

(111) **Simmons Reef,** about 5 miles NW of White Shoal, is about 2.8 miles long E and W and 1.6 miles wide. The reef has a rock awash near its center and depths of 3 to 6 feet scattered over a large area. The reef is dangerous in that it is composed of boulders that make up quickly from deep water. A lighted bell buoy marks the S side of the reef.

(112) **Fagan Reef,** 3 miles NW of Simmons Reef, is about 4 miles long and 2 miles wide. It has numerous shoal spots with depths less than 24 feet and a least depth of 10 feet at its W end.

(113) St. Helena Island and Shoal, Manitou Paymen Shoal, and other shoals along the N shore are discussed with the N shore of Lake Michigan.

(114) **Vienna Shoal,** with a least depth of 12 feet, is 2.4 miles WNW of Waugoshance Island on the E side of Grays Reef Passage. **East Shoal,** 1.4 miles SSW of Vienna Shoal, has a least depth of 17 feet. A lighted buoy on the W end of the shoal marks the E side of the dredged channel through Grays Reef Passage.

(115) **Grays Reef** is an extensive area of shallow water over rocks that extends from Grays Reef Passage W for 8.5 miles to Hog Island. The reef has depths ranging from rocks awash to 18 feet.

(116) **Grays Reef Passage,** between Vienna Shoal and East Shoal on the E and Grays Reef on the W, is the main route for vessels drawing less than 25 feet between the Straits of Mackinac and harbors S in Lake Michigan. The passage is obstructed at the center by **Middle Shoal,** with a depth of 17 feet, and by a bank with depths of 21 to 25 feet and a dumping ground close N of Middle Shoal. The main vessel route through the passage is a dredged channel, marked by a light and lighted buoys, on the E side of Middle Shoal. **Grays Reef Light** (45°46'00"N., 85°09'12"W.), 82 feet above the water, is shown from a white square tower on the W side of the dredged channel, just SE of Middle Shoal. A fog signal and a radar beacon (Racon) are at the light. The light should not be passed close aboard due to protective riprap. From the N end, the course through the channel is **186°** to Grays Reef Light and thence **216½°** toward North Manitou Shoal Light. In June 2000-June 2004, the controlling depth was 24.3 feet in the dredged channel (except for lesser depths to 23.6 feet along the W edge.) The channel through Grays Reef Passage on the W side of Middle Shoal is unmarked and no longer used by large vessels.

(117) Grays Reef Passage is a **regulated navigation area.** (See **33 CFR 165.1 through 165.13, and 165.901 (b) and (c),** chapter 2, for limits and regulations.)

(118) **Ile aux Galets** (locally pronounced skill-a-gal-lee) is a small island 7.7 miles SW of Waugoshance Island on the E side of the approach to Grays Reef Passage from the S. Shoals that extend 1.8 miles E from the island are marked at the outer end by a buoy, and shoals that extend 0.5 mile NW from the island are marked by a buoy. **Ile aux Galets Light** (45°40.6'N., 85°10.3'W.), 58 feet above the water, is shown from a white octagonal tower on the island.

(119) **Dahlia Shoal,** 3.7 miles SSW of Ile aux Galets, has a least depth of 14 feet and is marked on the W side by a buoy. A 21-foot spot is 1 mile NE of the buoy.

(120) **Hat Island,** the easternmost of the island group lying W of Grays Reef Passage, is on the N edge of Grays Reef, 11.5 miles WNW of Waugoshance Island and 10.5 miles NE of Beaver Island. Shoals extend 0.5 mile N from the island.

(121) **Hog Island,** 5.5 miles NE of Beaver Island, is low and wooded and completely surrounded by very shallow flats. Grays Reef extends E from the island, and shoals extend about 1.5 miles N and 2.5 miles S from the island. A very shallow bank, with numerous rocks awash, connects the island to Garden Island, 3 miles W. There is no vessel passage across the bank, which extends about 2 miles S from a line connecting the S ends of the islands. **Hog Island Reef,** a detached shoal 3.2 miles SSE of the island, has a least depth of 5 feet and is marked on the E side by a buoy.

(122) **Garden Island,** 1.5 miles N of Beaver Island, is generally high and wooded and is surrounded by shoal water. **Garden Island Shoal,** 2.5 miles N of Garden Island, has a least depth of 15 feet and is marked at the NE end by a lighted bell buoy. A shoal with a least depth of 16 feet is 1.2 miles N of Garden Island.

(123) **Squaw Island,** 3 miles WNW of Garden Island, is the northwesternmost of the island group W of Grays Reef Passage. An abandoned lighthouse is on the N end of the island. A shoal bank extends about 0.7 mile from the E, S, and W shores of the island; a buoy marks the outer edge of the bank on the E side. A shoal with depths of 6 to 16 feet that extends about 2 miles NNE from the island is marked at the outer end by a buoy. A detached 14-foot shoal is 1.8 miles NE of the island, and rocky spots covered 12 to 17 feet are 1 mile NW of the island.

(124) **Whiskey Island** is about 3.5 miles W of Garden Island and 1.7 miles SW of Squaw Island. Shoals extend about 0.5 mile offshore around the island, except about 1 mile E and SE. A buoy is 1 mile ESE of the island. A large detached bank, with several spots awash, is 1.2 miles SW of the island. The S side of the bank is marked by a buoy.

(125) In the passage between Garden Island on the E and Squaw and Whiskey Islands on the W, numerous detached ledges and spots have depths of 1 to 14 feet. Passage without local knowledge, by even shallow-draft vessels, is not recommended.

(126) **Lansing Shoals,** an extensive area of boulders with depths less than 24 feet, is from 4.4 to 6.2 miles N of Squaw Island. The shoalest spot, covered 13 feet, is at the SE end of the ledge. **Lansing Shoals Light** (45°54.2'N., 85°33.7'W.), 69 feet above the water, is shown from a square gray tower on the S side of the 13-foot spot; a seasonal fog signal and racon are at the light. Rip-rap extends 50 feet from the base of the light, and it should not be passed close aboard even by shallow-draft vessels. The light marks the N side of the vessel route from the Straits of Mackinac for vessels drawing over 25 feet.

(127) **Beaver Island,** the principal island in the group W of Grays Reef Passage, is 13 miles long N and S with a maximum width of 6.5 miles. The wooded island is bluff on the W side and lower on the E side. Shoals extend about 0.5 to 1 mile offshore around the island, except in Sandy Bay, about midlength of the E side, where deep water is within 0.2 mile of shore.

(128) The shoal bank that extends 0.7 mile NE from Beaver Island is marked at the outer edge by a lighted buoy. A 3-foot depth is just inside the buoy.

(129) Several reefs with depths of 8 to 12 feet are 1.5 miles E and 0.8 mile NE from the NE end of Beaver Island. These limit the draft for vessels navigating the channel between the shoal banks that extend off the N side of Beaver Island and the S side of Garden Island.

(130) **St. James Harbor** is a bight near the NE end of Beaver Island and is the harbor for the village of **St. James, Mich.,** on the NW side of the harbor. The harbor is protected on the E by **Sucker Point** and provides protection from all but SE winds. Sucker Point is marked on the SW side by **St. James Light** (45°44.6'N., 85°30.5'W.), 38 feet above the water and shown from a white cylindrical tower. Deep water extends from the lake across the center of the harbor, with the S end of the harbor shoal. Another shoal extends W across the harbor from Sucker Point to St. James, with deep water on the N side of the shoal near the head of the harbor. In September 1998, the dredged channel across the shoal had a controlling depth of 13 feet.

(131) Vessels approaching St. James Harbor must take care to avoid the shoal bank that extends S and E from Sucker Point. A lighted buoy and a buoy mark the S and SE limits of the bank, respectively. On the S side of the harbor entrance, shoals extend about 0.4 mile NE and 1 mile SE from **Looney Point.** The limits of these shoals are marked by a buoy and a lighted bell buoy, respectively. A detached gravel and boulder bank, covered 14 feet, is about 2 miles E of Looney Point.

Small-craft facilities

(132) A public dock constructed by the village and the Michigan State Waterways Commission at St. James provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 30 tons are also available in St. James.

Ferry

(133) Ferry service is available between St. James Harbor and Charlevoix, Mich., from April to December. Reservations are required for autos, but not for passengers or freight. The ferry terminal is 0.5 mile NW of St. James Light.

(134) **High Island,** about 3.8 miles W of the N end of Beaver Island, is a wooded island with a high sand ridge along the length of the W side. Shoals extend to 1 mile off the W shore and 0.5 to 0.8 mile off the S and E shores, except at the NE end of the island where a narrow point extends 0.5 mile E. Under this point, deep water is close-to, and good anchorage is available with protection from all but E and SE winds. Shoals extend 1.2 miles N and NE from this point. A shoal bank with depths of 12 to 15 feet extends about 2 miles NW from High Island and connects with the shoals surrounding Trout Island.

(135) **Trout Island,** 1.6 miles N of High Island, is connected to it by a shoal bank. Passage between the islands is unsafe for vessels drawing over 6 feet. A 4-foot spot 0.6 mile S of Trout Island must be avoided. Shoals extend about 0.2 to 0.5 mile offshore around Trout Island. **Trout Island Shoal,** 1.9 miles W of Trout Island, has a least depth of 11 feet and is marked on the NW side by a buoy.

(136) **Gull Island,** 6.7 miles W of High Island, is low, flat, and somewhat wooded. Shoals extend generally 0.5 mile offshore, except for banks that reach 1 mile SSE and 1.7 miles NE. Detached 21- and 23-foot spots are 1 mile NNW and 1.6 miles SE of the island, respectively. **Gull Island Light** (45°42.7'N., 85°50.6'W.), 77 feet above the water, is shown from a skeleton tower with a red and white diamond-shaped daymark on a bare spot

close NW of the island. **Gull Island Reef,** about 4 miles SE of the island, has a least depth of 3 feet and depths of 9 to 15 feet over a large area.

(137) **Richards Reef,** about 8 miles W of Beaver Island Light, is covered 22 feet.

(138) **Boulder Reef,** 9.5 miles SW of Gull Island, has a least depth of 15 feet and is marked on the S side by a lighted bell buoy.

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(139) **North Fox Island**, 10 miles SW of Beaver Island, is wooded. Shoals extend no more than 0.3 mile offshore except on the S and W sides where depths of 5 to 13 feet reach 1 mile from shore.

(140) **South Fox Island,** 4 miles SW of North Fox Island, is hilly on the W side and lower and wooded on the E side. An abandoned lighthouse is on the S end of the island. The E and W sides of the island are fairly deep-to, except for a 13-foot spot that reaches 0.8 mile off the W shore. A shoal bank and detached 18- to 21-foot spots reach 2.4 miles N from the island. A detached 21-foot spot is 3.3 miles N of the island. Shoals extend 0.8 mile around the S point of the island.

Caution

(141) Currents with velocities up to 2 mph are of frequent occurrence around North and South Fox Islands. Mariners should exercise caution while navigating in the area.

(142) **South Fox Island Shoals** is an extensive bank reaching 9 miles S from South Fox Island. A lighted buoy marks the S end of the bank. The bank has general depths of 15 to 30 feet with some shoaler spots. Two 9-foot spots are 4.2 and 7 miles S of South Fox Island, and an 11-foot spot is 6.4 miles S of the island. Buoys 4.2 and 6.2 miles S of the island mark a deepwater passage through the shoals. The bottom in the vicinity of the shoals is rocky, and deep-draft vessels should exercise caution in thick weather.

Charts 14902, 14913, 14912

(143) **Lighthouse Point** (45°12.6'N., 85°32.7'W.), the N point of the Leelanau Peninsula, is marked by Grand Traverse Light. Between Lighthouse Point and **Cathead Point,** 3.6 miles SW, **Cathead Bay** affords shelter in S winds. The bay is shoal however, with two rocky ledges that extend 0.9 mile from shore. Approaching Cathead Point from W, a clump of trees on the point gives it the appearance of an island.

(144) From Cathead Point SW for 14.5 miles to **Carp River Point,** the shore is generally bluff and hilly. Shoals extend generally less than 0.8 mile from shore, except for detached 7- and 8-foot spots 1.2 miles offshore 5 miles NE of Carp River Point. Leland, Mich., is 1.2 miles NE of Carp River Point.

Charts 14902, 14912

(145) **Leland, Mich.**, is a village and small-craft harbor at the mouth of Leland River about 32 miles SW of Charlevoix. Local fish tugs and recreational craft are the principal users of the harbor.

Channels

(146) The harbor is protected on the N and NW by a detached breakwater and on the SW by a pier extending lakeward from the S side of the mouth of Leland River. The outer end of the pier and the SW end of the breakwater are marked by lights. An anchorage area inside the breakwater is approached from the SW through a dredged channel between the breakwater and pier. A dredged channel leads from the S end of the anchorage to the mouth of the river, and a marina basin, maintained by private interests, is on the E side of the anchorage.

(147) In May 2006, the controlling depth was 9.6 feet in the entrance channel, between the breakwaters and pier, to the anchorage area (except for shoaling to 5.4 feet along the NW edge of the channel near the outer end of the breakwater), thence depths of 9 to 10 feet were available in the anchorage area; thence 6.1 feet in the channel to the mouth of the river. In 1980, 3½ feet was in the marina basin except for shoaling to bare in the N end and along the E side.

(148) **Leland River** is a narrow crooked stream about 0.8 mile long which connects Lake Leelanau to Lake Michigan. A dam crosses the river about 400 feet above the mouth. The Main Street bridge 250 feet above the dam has a vertical clearance of about 4 feet. From this bridge to Lake Leelanau, the river is navigable by shallow-draft vessels.

(149) **Lake Leelanau** is 16 miles long and as much as 1.8 miles wide. The upper and lower ends of the lake have good depths, but in the constriction near the middle of the lake at the village of Lake Leelanau, available depths are only 3 feet. A fixed highway bridge with a clearance of about 15 feet crosses the lake at the village.

Small-craft facilities

(150) A public dock constructed by the Michigan State Waterways Commission in Leland harbor provides

transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9.

Ferry

(151) Mail and ferry service is available between Leland and North and South Manitou Islands from April through December with regular service. Irregular service is available from January through March depending on ice conditions. The terminal is on the E side of the Leland River mouth.

(152) **Good Harbor Bay,** between Carp River Point and **Pyramid Point** 7.7 miles WSW, has deep water close to shore and affords protection in all but N to NE winds. However, in the NE part of the bay, an extensive rocky ledge with depths of 2 to 18 feet is 1 to 3 miles offshore.

(153) **Pyramid Point Shoal,** with a least depth of 7 feet, extends 2 miles N from Pyramid Point. A lighted buoy marks the N end of the shoal.

(154) **Sleeping Bear Bay** lies between Pyramid Point and **Sleeping Bear Point** (44°54.9'N., 86°02.5'W.), 6.8 miles SW. The shores of the bay are generally deep-to, except for a rocky ledge with depths of 4 feet that extends 0.8 mile from shore 3 miles SW of Pyramid Point, which is bluff. The bay affords good shelter from NE through S to W winds. Very good holding ground is found under Pyramid Point. At **Glen Haven, Mich.,** a village on the SW side of the bay, the waterfront is in ruins and no services are available.

(155) **Sleeping Bear Shoal,** with boulders covered 17 to 24 feet, extends 1.2 miles W from Sleeping Bear Point. Detached spots less than 30 feet extend 4 miles farther W from the point and are marked near the outer limit by a lighted bell buoy. Vessels using Manitou Passage should keep N and W of the buoy.

(156) **Manitou Passage,** between North and South Manitou Islands and the mainland, is used by deep-draft vessels bound between Grays Reef Passage and the S end of Lake Michigan. The passage has good deep water and a least width of about 1.8 miles between Pyramid Point Shoal and North Manitou Shoals.

(157) **North Manitou Island,** 6.5 miles N of Pyramid Point, is a hilly and wooded island 7 miles long N and S and 4.2 miles wide. A lee can be found under the island with generally good holding ground. The bight on the E side affords good shelter from W winds. The N shore is deep-to with several detached spots of 24 to 29 feet. The E shore is clear to within 0.4 mile and the W shore to within 0.6 mile. A shoal bank with depths of 4 to 15 feet extends 1.5 miles S from **Donner Point** at the SW end of the island and extends E to a point 2 miles S of **Dimmicks Point.** In 1981, numerous boulders were reported to exist from close inshore to about 0.4 mile offshore between Donner and Dimmicks Points. **North Manitou Shoals,** an area of foul ground with depths of 16 to 30 feet, extend 3 miles S of Dimmicks Point and 3.5 miles S of Donner Point. A buoy marks the extent S of Donner Point. **North Manitou Shoals Light** (45°01.2'N., 85°57.4'W.), 79 feet above the water, is shown from a white square structure 2.8 miles S of Dimmicks Point; a seasonal fog signal and racon are at the light.

(158) **South Manitou Island** is 6.8 miles N of Sleeping Bear Point and 3.9 miles SW of North Manitou Island with a deep channel between. The island is hilly and bluff on the W side and lower and wooded on the E side. A 100-foot high abandoned lighthouse is on the SE point of the island. The shores of the island are relatively deep-to, except the S side where shoals with depths of 10 to 19 feet extend 1 mile offshore. A visible wreck is close to the SW shore of the island. Detached 18- and 19-foot spots are 1.5 miles S and 2.8 miles SW of the island, respectively. A lighted gong buoy is on the SW side of the 19-foot spot. **South Manitou Harbor**, on the SE side of the island, affords anchorage with good holding ground and protection from SW through N to NE winds.

Ferry

(159) Mail and ferry service is available between North and South Manitou Islands and Leland during most of the year, depending on ice conditions.

(160) From Sleeping Bear Point, the shoreline trends S for 8 miles to a high rounding point known as **Empire Bluffs.** Shoals extend 0.7 mile offshore at the bluffs, and a detached 23-foot spot is 2 miles offshore. At **Empire, Mich.,** just N of the bluffs, two piers in ruins extend into the lake; in 1978, they were almost completely covered with sand.

(161) From Empire Bluffs, the shoreline continues S and then bends W to **Platte River Point** at the mouth of the **Platte River. Platte Bay** is the bight between Empire Bluffs and Platte River Point. The shore of the bay is bluff with deep water close-to. A shoal, with rocks awash and a depth of 10 feet at the outer end, extends 1.5 miles N from Platte River Point.

Charts 14902, 14907

(162) From Platte River Point SW for 5.7 miles to Point Betsie, the shore is bold and hilly, and there are no outlying obstructions. **Point Betsie** is a rounding sandy point. **Point Betsie Light** (44°41.5'N., 86°15.3'W.),

52 feet above the water, is shown from a white cylindrical tower with a red roof and attached dwelling on the point. The light marks the turning point for vessels bound between Manitou Passage and the S end of Lake Michigan.

(163) From Point Betsie, the shore continues sandy and hilly for 4.3 miles S to Frankfort Harbor.

(164) **Frankfort Harbor,** 4.3 miles S of Point Betsie, is in Betsie Lake, connected to Lake Michigan by an entrance channel. The shore S of the entrance channel is bluff, reaching over 300 feet above the lake. The city of **Frankfort, Mich.,** is on the N side of Betsie Lake. A tank on a hill 0.75 mile NE of the harbor entrance is prominent from Lake Michigan.

(165) **Frankfort North Breakwater Light** (44°37.9'N., 86°15.1'W.), 72 feet above the water, is shown from a square white pyramidal tower on the N side of the harbor entrance. A fog signal is at the light. An aerolight is 2.1 miles NE of the light.

Channels

(166) The harbor is entered from Lake Michigan through a dredged entrance channel between converging breakwaters to an outer harbor basin which is not adapted for anchorage but reduces wave action in the inner harbor. From the outer basin, the channel continues E between parallel piers to an inner basin and anchorage area in Betsie Lake. The outer ends of the breakwaters and piers are marked by lights.

(167) In March-May 2004, the controlling depth was 22 feet in the entrance, through the outer basin and between the piers to the inner basin (except for lesser depths to 20.3 feet along the edges of the channel and shoaling to 13.4 feet in the right outside quarter of the entrance channel in the vicinity of the outer end of the S breakwater), thence the areas N and S of the entrance channel in the outer basin had a depth of 20 feet with lesser depths to 13.2 feet along the E edge of the N area, and to 15.1 feet along the SW edge of the S area; thence in October 2003, 16 to 18 feet in the inner basin (except for lesser depths to 12.7 feet in the NW corner and to 13.4 feet in the NE corner), thence 9.9 feet in the anchorage area.

(168) **Betsie Lake,** extends about 1.5 miles SE from the inner end of the entrance channel. Outside the dredged areas, the lake is generally shoal, with depths of 8 feet and less. The SE end of the lake is filled with submerged pilings, and at the extreme end, off the mouth of **Betsie River,** the lake is swampy. Anchorage in the lake is poor. A private channel extends from the inner harbor basin E through Betsie Lake to a private dock. In 1975, the controlling depth in the channel was 7 feet.

Bridges

(169) Betsie River is crossed near its mouth by a fixed highway bridge with a clearance of 4 feet and by a fixed railroad bridge with a 14-foot span and a clearance of 7 feet.

Currents

(170) Currents in the Frankfort Harbor entrance channel attain velocities up to 3 mph in either direction.

(171) **Frankfort Coast Guard Station** is on the N side of the harbor entrance channel. A radiobeacon is at the station.

Harbor regulations

(172) A **speed limit** of 8 mph is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Mooring to the breakwaters, piers, or revetments is prohibited.

(173) A **special anchorage** area, marked by private buoys, is in Betsie Lake. (See **33 CFR 110.1 and 110.81a,** chapter 2, for limits and regulations.)

Wharves

(174) Koch Fuels, Inc. receives petroleum products at a 425-foot wharf on the S side of the inner basin. The wharf has a deck height of 8 feet with reported depths of 18 to 20 feet alongside. There is tank storage for 310,000 barrels of petroleum.

Small-craft facilities

(175) A public dock constructed by the Michigan State Waterways Commission on the N side of the inner basin provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. A marine railway for small craft is available in the harbor.

(176) From Frankfort S for about 19 miles to Portage Lake, the shore is bold and wooded with many hills from 300 to 400 feet high. The shore is deep-to except just S of the entrance to Arcadia Lake where depths under 24 feet extend 0.8 mile offshore. A submerged wreck is 0.5 mile offshore 6.6 miles S of Frankfort.

(177) **Arcadia Lake,** 10 miles S of Frankfort, is an L-shaped lake separated from Lake Michigan by a narrow strip of land. The N arm of the lake has depths to 26 feet and deep-to shores. The larger S part of the lake has depths over 7 feet in the W end and shoals off into heavy weeds and marsh at the E end. At the SW end of the lake an entrance channel has been dredged from Lake Michigan.

(178) **Arcadia, Mich.,** is a village at the N end of Arcadia Lake about 14 miles S of Point Betsie.

(179) Arcadia Lake is entered from deep water in Lake Michigan through a dredged entrance channel between parallel piers and revetments to the deep water inside the lake. The pierheads are marked by lights. In May 2006, the controlling depth was 8.2 feet in the entrance channel to the lake. The entrance channel is subject to extensive shoaling. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Small-craft facilities

(180) A marina developed by the Michigan State Waterways Commission and a private marina are located in the north arm of the lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. At the private marina, a 10-ton hoist is available for hull and engine repairs.

Charts 14907, 14939

(181) **Portage Lake**, 23 miles S of Point Betsie, is separated from Lake Michigan by a narrow strip of land. The lake, 3.3 miles long and 0.6 to 1.5 miles wide, has central depths of 14 to 60 feet with gradual shoaling toward shore. A shoal, marked by a lighted buoy, has depths of 7 to 12 feet near its outer end and extends 0.4 mile S from North Point, about 0.9 mile E of the entrance channel. **Onekama, Mich.,** is a village on the N side of the lake at the E end.

Channels

(182) The dredged entrance channel leads from Lake Michigan between parallel piers and revetments to the deep water inside Portage Lake. The outer ends of the piers and the Portage Lake end of the S pier are marked by lights; a fog signal is at the N outer end light. In June 2006, the controlling depth was 7.2 feet in the entrance channel (except for shoaling to 4.8 feet in the right half of the channel in about 44°21'34"N., 86°15'47"W.) The channel is subject to shoaling from sand swept in by shore currents. The currents in the entrance channel attain velocities up to 3 mph in either direction.

(183) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(184) Good anchorage is available in Portage Lake.

(185) A **speed limit** of 8 mph (7 knots) is enforced in Portage Lake. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(186) A marina on the S side of Portage Lake just E of Eagle Point provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and marine supplies. A 14-ton mobile hoist and a 50-ton marine railway are available for hull and engine repairs. In 1978, there were reported depths of 5 to 12 feet alongside the docks and 10 feet alongside the fuel pumps.

Chart 14907

(187) From Portage Lake SSW for 8.3 miles to Manistee, the shore continues somewhat bluff, generally 60 feet high, with several hills 115 to 180 feet high. The 18-foot contour is no more than 0.4 mile offshore.

Charts 14907, 14938

(188) **Manistee Harbor**, 31 miles S of Point Betsie, is on the **Manistee River,** which flows from the N end of Manistee Lake for 1.5 miles to Lake Michigan. There are extensive facilities along both sides of the river and on the W side of Manistee Lake. The principal cargo handled is coal, with occasional shipments of salt and machinery. The harbor is also a base for fish tugs. A radio mast at the N end of Manistee Lake is prominent.

(189) **Manistee North Pierhead Light** (44°15.1'N., 86°20.8'W.), 55 feet above the water, is shown from a white cylindrical tower on the outer end of the N pier; a fog signal is at the light.

Channels

(190) The entrance to Manistee River is protected on the SW by a breakwater. A dredged entrance channel leads from deep water in Lake Michigan through the N part of the outer harbor basin to the river entrance between two piers and through the river channel to Manistee Lake.

(191) In October 2006, the controlling depth was 14.2 feet in the entrance and through the river to Manistee Lake.

(192) Currents in the river attain velocities up to 3 mph in either direction.

(193) Numerous submerged pile clusters extend along the N channel limit from the outer end of the N pier to its inner end. Large pile clusters protect each end of the revetment upstream of the N pier.

(194) The outer basin, enclosed by the S breakwater and N pier, is not adapted for anchorage, but reduces

wave action in the inner harbor. Mooring to the breakwater, piers, or revetments is prohibited. Large riprap stones are along both sides and across the ends of the breakwater and pier, and navigation should not be attempted close to these structures.

(195) **Manistee Lake,** about 4 miles long and up to 0.5 mile wide, has depths to 50 feet, with the shores generally deep-to. Buoys mark the outer ends of shoals and submerged dock ruins from the inner end of Manistee River S in the lake. Good anchorage is in the N part of the lake in depths of 20 to 25 feet.

(196) **Big Manistee River** entering Manistee Lake at its N end, flows through a flat valley with numerous cutoffs and sloughs, and is crossed by a number of fixed bridges. The channel is tortuous, with depths varying from 1½ to 11 feet to a dam which crosses the river about 30 miles above the mouth.

Bridges

(197) Maple Street bridge, about 1.1 miles above the mouth of Manistee River, has a bascule span with a clearance of 23 feet. U.S. Route 31 bridge, 1.4 miles above the mouth, has a bascule span with a clearance of 32 feet. The CSX railroad bridge, 1.5 miles above the mouth, has a swing span with a clearance of 13 feet. (See **33 CFR 117.1 through 117.59 and 117.637,** chapter 2, for drawbridge regulations.) An overhead power cable at the head of the river has a clearance of 145 feet.

Coast Guard

(198) **Manistee Coast Guard Station,** seasonally operated, is on the N side of the entrance to Manistee Harbor.

Harbor regulations

(199) Harbor regulations have been established by the city of Manistee and are enforced by the **harbormaster.** Copies of regulations may be obtained from the Chief of Police at City Hall. A **slow-no wake speed** is enforced in the Manistee River. Federal regulations specify an 8 mph (7 knots) **speed limit** for vessels over 40 feet in length. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(200) Manistee has several deep-draft facilities. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(201) **Seng Crane and Excavating Dock No. 1:** S side of the head of Manistee River; 900-foot face; 20 to 25 feet alongside; deck height, 5 feet; open storage for 300,000 tons of material; receipt of sand, salt, and coal; owned and operated by Seng Crane and Excavating, Inc.

(202) **Morton Salt Co. Coal Dock:** (44°14'36"N., 86°18'29"W.); 400-foot face; deck height, 4 feet; open storage for 45,000 tons of coal; receipt of coal; owned and operated by Morton Salt Division of Morton International, Inc.

(203) **Morton Specialty Chemical Products, Manistee Stone Dock:** across slip S of Coal Dock; 600-foot face; covered storage for 10,000 tons of limestone; receipt of limestone; owned and operated by Morton Specialty Chemical Products, Division Morton International Inc.

(204) **Akzo Nobel Salt, Manistee Plant Dock:** (44°13'51"N., 86°18'06"W.); about 400 feet of berthing space; 19 to 21 feet alongside; deck height, 6 feet; open storage for 200,000 tons of coal; receipt of coal; owned and operated by Akzo Nobel Salt, Inc.

(205) **Seng Crane and Excavating Dock No. 2:** (44°13'44"N., 86°18'08"W.); 1,200-foot face; 24 to 27 feet alongside; deck height, 3 to 4 feet; open storage for 200,000 tons of material; receipt of coal, stone and salt; owned and operated by Seng Crane and Excavating, Inc.

(206) **Packaging Corp. of America Dock:** (44°13'10"N., 86°17'22"W.); 767-foot face, 24 feet alongside; receipt of coal; owned by Packaging Corp. of America and operated by TES Filer City Station Ltd.

Small-craft facilities

(207) A public dock constructed by the Michigan State Waterways Commission is on the S side of the Manistee River just inside the mouth. There are private marinas on the N side of the river 0.7 mile above the mouth and at the N end of Manistee Lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. The marina at the N end of Manistee Lake has a 20-ton marine railway for hull and engine repairs.

Chart 14907

(208) From Manistee SSW for 16 miles to Big Sable Point, the shore is bluff, with a few hills. The 18-foot contour is about 0.4 mile offshore. **Big Sable Point,** 45 miles S of Point Betsie, has a low shoreline with hills rising inland. **Big Sable Light** (44°03.5'N., 86°30.9'W.), 106 feet above the water, is shown from a conical tower, white with middle third and top black, with an attached dwelling on the point.

(209) From Big Sable Point SSE for 7.5 miles to Ludington, the shore is clear to within 0.5 mile. The land in this stretch is generally low, except in the

vicinity of Lincoln Lake where the bluffs reach 120 to 180 feet in height. **Big Sable River,** the outlet of Hamlin Lake, flows into Lake Michigan 2 miles S of Big Sable Point. A dam crosses the river about 0.8 mile above the mouth.

Charts 14907, 14937

(210) **Ludington Harbor** is in Pere Marquette Lake, 7.5 miles S of Big Sable Point. The city of **Ludington, Mich.,** is on the N side of the lake.

(211) **Ludington North Breakwater Light** (43°57'13"N., 86°28'10"W.), 55 feet above the water, is shown from a white square pyramidal tower on the outer end of the N breakwater; a fog signal is at the light.

Channels

(212) A dredged entrance channel leads E from deep water in Lake Michigan between converging breakwaters to an outer harbor basin. The outer ends of the breakwaters are marked by lights. From the basin, the channel leads to the N end of Pere Marquette Lake. The channel is protected by piers and revetments on the N and S sides. The piers are marked at their outer ends by lights.

(213) In September 2005-November 2006, the controlling depths were 17.2 feet (22 feet at midchannel) in the entrance channel and through the outer harbor basin to naturally deep water in Pere Marquette Lake. In 1997, depths of 20 feet were available in the N outer basin with lesser depths along the edge and depths of 5½ to 20 feet were available in the S outer basin.

(214) The outer basin is not adapted for anchorage of vessels, but reduces wave action in the inner harbor. Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(215) **Pere Marquette Lake** is about 2 miles long, including a marsh at the S end, has an average width of 0.5 mile, and is up to 43 feet deep. The anchorage is good. **Pere Marquette River,** which flows into the S end of Pere Marquette Lake, is not navigable above the lake except for rowboats and small launches.

(216) A buoy marks the outer end of submerged dock ruins on the W side of Pere Marquette Lake. Buoys mark the N side of the channel leading to the small-craft facilities in the inlet on the NE side of the lake.

Caution

(217) NW and SW winds make entry between the breakwaters hazardous. Vessels usually increase their speed until just inside the breakwaters to compensate. Small-craft operators transiting from S to N have reported that South Breakwater Light is sometimes difficult to see because of the brilliance of North Breakwater Light.

Bridges

(218) A fixed highway bridge with a clearance of 12 feet crosses the inlet on the NE side of Pere Marquette Lake.

Coast Guard

(219) Ludington Coast Guard Station is on the N side of the harbor entrance.

Harbor regulations

(220) A **speed limit** of 8 mph (7 knots) is enforced when entering or leaving Ludington Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(221) Ludington has three deep-draft facilities. (For complete information on the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(222) **Dow Chemical U.S.A., Ludington Plant West Wharf:** (43°56'28"N., 86°26'01"W.); 1,367-foot face; 23 to 27 feet alongside; deck height, 4½ feet; open storage for 500,000 tons of limestone; receipt of limestone; owned and operated by Dow Chemical U.S.A.

(223) **Dow Chemical U.S.A., Ludington Plant East Wharf:** (43°56'20"N., 86°26'23"W.); 550-foot face; 28 feet alongside; deck height, 4½ feet; shipment of liquid calcium chloride; owned and operated by Dow Chemical U.S.A.

Small-craft facilities

(224) A marina developed by the Michigan State Waterways Commission is on the N side of Pere Marquette Lake, and private marinas are on the NE side, W side and in the NE arm of the lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, launching ramps, hoists to 25 tons, marine supplies and harbormasters services are available. The harbor master monitors VHF-FM channels 9 and 16. Hull and engine repairs are available in the NE arm and W side of the lake.

Ferries

(225) Ferry service is available from Ludington to Manitowoc, WI. from about mid May to the end of October for autos, and passengers. The terminal is about 1 mile SE of the harbor entrance.

Chart 14907

(226) From Ludington S for 12 miles to Pentwater, the shore is bluff, with hills reaching 150 to 250 feet high. The shoal border is regular, and there are no outlying dangers. At the Ludington Pumped Storage Hydroelectric Plant, 4 miles S of Ludington, two jetties extend from shore and are attached by log booms to a detached breakwater. These structures are marked by private lighted buoys, and navigation should not be attempted close to them. The outlet of **Bass Lake,** 8.5 miles S of Ludington, is blocked by a dam at the Lake Michigan shoreline, and its water level is about 3 feet above Low Water Datum.

(227) **Pentwater Harbor,** serving the town of **Pentwater, Mich.,** is in Pentwater Lake, 20 miles S of Big Sable Point. Pentwater Lake is connected to Lake Michigan by a dredged entrance channel.

Channels

(228) The dredged channel leads from deep water in Lake Michigan SE between piers and revetments to the N end of Pentwater Lake. The outer ends of the piers are marked by lights; the N pier light has a fog signal. In April-June 2005, the controlling depth was 10.5 feet in the entrance and between the piers to the lake (except for shoaling to 6.3 feet in the NE corner of the entrance channel off the end of the N pier.) Currents in the channel attain velocities up to 3 mph in either direction.

(229) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(230) **Pentwater Lake,** about 2 miles long and 0.5 mile wide with depths of 25 to 50 feet, provides good anchorage. **Pentwater River,** at the head of the lake, has depths of 1 foot and is crossed by a highway bridge at the mouth.

(231) A **slow-no wake speed** is enforced in Pentwater Lake and in the entrance channel. Federal regulations specify an 8 mph (7 knots) **speed limit** for vessels over 40 feet in length. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(232) A public dock constructed by the village and the Michigan State Waterways Commission is in the NW part of Pentwater Lake SE of the entrance channel. A private marina is further SE. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A 16-ton hoist is available for hull and engine repairs.

(233) From Pentwater Harbor, the shore trends SW for 10 miles to Little Sable Point. This stretch is a continuous line of bluffs with a regular shoal border and several off-lying wrecks. A wreck, covered 18 feet, is 0.5 mile offshore 2 miles SW of Pentwater Harbor, and a wreck, covered 1 foot and marked by a buoy, is close to shore 7 miles SW of the harbor. **Little Sable Point** is a broad rounding point 28 miles S of Big Sable Point. **Little Sable Light** (43°39.0'N., 86°32.4'W.), 108 feet above the water, is shown from a conical red brick tower on the point.

Charts 14907, 14906

(234) From Little Sable Point, the shore trends SSE for 20 miles to White Lake. This stretch is quite rugged, with no shoals beyond 0.5 mile from shore. A wreck, covered ½ foot, is close to shore 0.8 mile S of Little Sable Light.

(235) **Stony Lake,** 6.5 miles S of Little Sable Point has its outlet into Lake Michigan through **Stony Creek.** Rows of old piles at the mouth of the creek are the only remainder of former lumber loading facilities. The creek is not navigable.

Chart 14906

(236) About 4 miles S of Stony Lake, several hills from 125 to 245 feet high are along the shore.

Charts 14906, 14935

(237) **White Lake**, about 20 miles SSE of Little Sable Point, is separated from Lake Michigan by a narrow strip of sandy bluffs. A dredged cut affords access between the lakes. The towns of **Montague, Mich.,** and **Whitehall, Mich.,** are at the NE end of White Lake about 4 miles above the cut.

Channels

(238) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments to the W end of White Lake. The outer ends of the piers and the inner end of the S pier are marked by

lights. The outer end of the channel between the piers is subject to extensive shoaling. In August 2006, the controlling depth was 8.2 feet between the piers and revetments to White Lake. Currents in the channel attain velocities up to 3 mph in either direction.

(239) Mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(240) In White Lake, at the inner end of the dredged channel, the channel bends SE around the shoal off **Indian Point.** The S edge of the shoal is marked by lighted buoys. The lake has central depths of 25 to 70 feet with shoals extending as much as 0.6 mile from shore. Lighted buoys and lights at the outer edges of the shoals mark the deep water through the lake to its head. **White River** flows into the head of the lake between Montague and Whitehall. The bar at the mouth of the river has depths of 2 feet.

Anchorages

(241) The preferred anchorages in White Lake are in the NW end of the bay in the upper part of Indian Bay in depths of 25 to 30 feet, mud bottom; in the SW part of the lake W of the yacht club in 10 to 25 feet, sand bottom; and in the NE end of the lake S and W of the city dock in 8 to 10 feet, mud bottom.

Bridges

(242) A fixed highway bridge and a fixed railroad bridge, with a reported least clearance of 4 feet, cross White River just above the mouth.

(243) A **speed limit** of 8 mph (7 knots) is enforced in White Lake. (See **33 CFR 162.120,** chapter 2, for regulations.)

(244) Hooker Chemicals and Plastics Corp. ships caustic soda from a facility on the N shore of White Lake 2.4 miles ENE of Indian Point. The offshore wharf has a deck height of about 11 feet and provides 150 feet of berthing space along dolphins. The reported depth alongside is 20 feet. The facility has tank storage for 1½ million gallons.

Small-craft facilities

(245) A marina developed by the Michigan State Waterways Commission is at Whitehall. Marinas here and at Montague provide transient berths, gasoline, diesel

fuel, water, ice, electricity, sewage pump-out, marine supplies, launching ramp, and harbormaster services. The harbormaster monitors VHF-FM channels 16 and 9. Hoists to 30 tons and a 15-ton marine railway for boats to 38 feet are available for hull, engine, and electronic repairs.

Chart 14906

(246) From White Lake, the shoreline continues SSE for 11 miles to Muskegon Lake. The shore consists of low sand bluffs and wooded hills, and is clear of shoals to within 0.6 mile.

Charts 14906, 14934

(247) **Muskegon Harbor**, 31 miles SSE of Little Sable Point, consists of Muskegon Lake and a dredged entrance channel which connects it with Lake Michigan. Facilities for a wide range of commerce are on the S shore of the harbor at the city of **Muskegon, Mich.,** and at its E end.

Prominent features

(248) A lighted stack of the Consumers Energy Co. at the mouth of the Muskegon River in 43°15'16"N., 86°14'23"W. is prominent from Lake Michigan. Sandhills N and S of the harbor entrance may obstruct the stack from some directions.

(249) **Muskegon South Breakwater Light** (43°13'30"N., 86°20'48"W.), 70 feet above the water, is shown from a pyramidal tower on the outer end of the S breakwater; a fog signal is at the light.

Channels

(250) The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters to an outer basin, thence between piers and revetments to Muskegon Lake. The outer ends of the breakwaters and piers, and the inner ends of piers, are marked by lights. A fog signal is at the light on the S pier. In August 2006, the controlling depth was 26.2 feet in the entrance, through the outer basin and between the piers to Muskegon Lake (except for shoaling to 23.1 feet in the right outside quarter and to 21.7 feet in the left outside quarter of the entrance channel, just W of both breakwater lights, and to 23.7 feet along the N side of the channel between the piers, about 600 feet above the outer ends of the piers.)

(251) Currents in the channel attain velocities up to 3 mph in either direction.

(252) The outer basin is not adapted for anchorage of vessels, but reduces wave action in the entrance channel.

(253) Mooring to the breakwaters, piers, and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap. In 2001, a rock bed was reported 30 feet N of the South Breakwater Light.

(254) **Muskegon Lake** is about 4 miles long and varies from 2 miles wide at the W end to as little as 0.6 mile in the E part. The lake has central depths of 25 to 79 feet. Near midlength of the lake, shoals marked at the outer edges by lights extend from the N and S shores and restrict the available width of deep water to 1,600 feet. There are many obstructions in the shallow parts of the lake, including cribs, pipelines, and submerged pilings and dock ruins.

(255) The North Channel of the **Muskegon River** flows into the NE end of Muskegon Lake. The channel, at a river stage of about 2 feet above extreme low water, has depths of 2½ to 9 feet for 33 miles above the mouth to the former dam at **Newaygo, Mich.** Two fixed bridges, with a reported least clearance of 8 feet, cross the river about 0.3 mile and 0.4 mile above the mouth.

(256) **Bear Lake** parallels the NW side of the NE end of Muskegon Lake and has its outflow through a narrow channel into its N side. **North Muskegon, Mich.,** is the community on the peninsula between the two lakes.

Anchorage

(257) Muskegon Lake affords good anchorage, generally sand or mud bottom. Special anchorages are in the SW part of the lake and on the S side at Muskegon. (See **33 CFR 110.1 and 110.81,** chapter 2, for limits and regulations.)

Weather, Muskegon and vicinity

(258) Muskegon, MI, is located on the east shore of Lake Michigan and in the west-central portion of the state. The location averages about three days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 81°F (27.2°C) and an average minimum of 60°F (15.6°C). January is the coolest month with an average high of 30°F (-1°C) and an average minimum of 18°F (-7.8°C). The highest temperature on record for Muskegon is 99°F (37.2°C) recorded in August 1964 and the lowest temperature on record is -15°F (-26.1°C) recorded in December 1976. About 141 days each year experience temperatures below 32°F (0°C) and an average ten days each year records temperatures below 5°F (-15°C). Every month has seen temperatures below 40°F (4.4°C) except July (extreme

minimum is 41°F (5°C)) and every month except July and August has recorded temperatures below freezing (0°C).

(259) The average annual precipitation for Muskegon is 32.56 inches (827 mm) which is fairly evenly distributed throughout the year. Precipitation falls on about 208 days each year. The wettest month is September with 3.32 inches (84 mm) and the driest, February, averages only 1.65 inches (42 mm). An average of 35 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 93 days each year and averages about 104 inches (2642 mm) each year. January averages nearly 34 inches (864 mm) per year while December averages nearly 27 inches (686 mm) each year. One-foot (305 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About 24 days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June, July, and August. Fog is present on average 140 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer and early autumn.

(260) The prevailing wind direction in Muskegon is the west-northwest. Late winter through spring is the windiest period but a maximum gust of 58 knots occurred in February 1987.

(261) (See Page 541 for **Muskegon climatological table.**)

(262) Muskegon is a **customs port of entry**.

Quarantine, customs, immigration, and agricultural quarantine.

(263) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(264) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Harbor regulations

(265) A **speed limit** of 8 mph is enforced in Muskegon Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) A **slow-no wake speed** is enforced in the Bear Lake entrance channel.

Wharves

(266) Muskegon has numerous deep-draft facilities along the S shore of Muskegon Lake. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(267) **SAPPI Fine Paper, Muskegon Mill Coal Slip:** (43°12'59"N., 86°18'28"W.); 500-foot faces, E and W sides; 24 feet alongside; natural bank height, 4 to 5 feet; open storage for 250,000 tons of material; receipt of coal for plant consumption; owned and operated by SAPPI Fine Paper Co.

(268) **Stoneco, a division of Great Lakes Dock and Materials Co. Pier:** (43°13'17"N., 86°17'24"W.); 400-foot N side, 900-foot E side; 45 feet alongside N side and 28 feet alongside E side; deck height, 9 feet; open storage for 250,000 tons of bulk materials; receipt of dry bulk commodities, including limestone, slag, salt, coal, and coke; owned by John H. Bultema and operated by Great Lakes Dock and Materials Co.

(269) **Lafarge Corp., Muskegon Terminal Pier:** (43°14'04"N., 86°15'43"W.); 529-foot face, 900 feet with dolphins; 19 to 22 feet alongside: deck height, 6 feet; pneumatic pipelines extend to storage silos, nominal rate of delivery, 400-600 tons per hours; storage silos for 13,800 tons of cement; receipt of bulk cement; owned and operated by Lafarge Corp.

(270) **West Michigan Dock & Market Corp., Outer Dock, Berths Nos. 3, 4 and 5:** (43°14'16"N., 86°15'39"W.); 1,350 feet of berthing space; 21 to 25 feet alongside; deck heights, 6 and 5 feet; 40,000 square feet covered storage; 5.3 acres open storage; 15-ton gantry crane; receipt of limestone, pig iron, and other dry bulk commodities; shipment of scrap metal; owned and operated by West Michigan Dock & Market Corp.

(271) **West Michigan Dock & Market Corp., Upper Dock, Berths Nos. 6 and 7:** (43°14'19"N., 86°15'31"W.); 784-foot face; 25 feet alongside; deck height, 6 feet; 72,000 square feet covered storage; receipt of limestone, pig iron, and miscellaneous dry bulk materials; owned and operated by West Michigan Dock & Market Corp.

(272) **Verplank Dock Co., Salt Dock:** (43°14'36"N., 86°14'55"W.); 1,200 feet of natural and improved bank; 18-21 feet alongside; deck height, 8 feet; open storage for 250,000 tons of salt; owned and operated by Verplank Coal and Dock Co.

(273) **Verplank Dock Co.:** (43°15'09"N., 86°14'38"W.); 1,200 feet of natural bank; 28 feet alongside; bank height, 4 feet; open storage for 200,000 tons of material; receipt of limestone and slag; owned by Consumers Energy and operated by Verplank Coal and Dock Co.

(274) **Consumers Energy Co., B.C. Cobb Plant Wharf:** (43°15'08"N., 86°14'47"W.); 1,800 feet of berthing space along dolphins; 30 feet alongside; deck height, 8½ feet; receiving hopper served by electric belt conveyor extending to stacker, rate 4,000 tons per hour; 22 acres open storage; receipt of coal for plant consumption; owned and operated by Consumers Energy Co.

Small-craft facilities

(275) A public docking facility is available mid-length of the S lakeshore at the Hartshorn Marina (43°13'48"N., 86°15'54"W.), jointly constructed by the city and the Michigan State Waterways Commission. Several private marinas are along the S shore of Lake Muskegon and can provide: transient berths, gasoline, diesel fuel, marine supplies, sewage pump-out, complete vessel repair, and hoists to 110 tons. A private marina is on the N shore at the outlet of Bear Lake. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A 30-ton mobile hoist is available for engine repairs, and limited hull and electronic repairs.

Ferries

(276) A ferry which carries passengers and/or vehicles operates between Muskegon and Milwaukee, WI from a terminal on the S side of Lake Macatawa, just N of a marina, in about 43°13'10"N., 86°17'30"W.

Communications

(277) Muskegon has good highway and rail connections. The city is served by Muskegon County Airport S of the city.

Chart 14906

(278) From Muskegon, the shore extends SSE for 12.5 miles to Grand Haven. The N 5 miles of this reach has hills to 205 feet high; the remainder of the stretch is lower. Deep water is about 0.5 mile offshore. Two unmarked fish havens are about 0.5 mile S of the Muskegon Harbor entrance.

(279) **Mona Lake,** a small body of water 4.8 miles S of Muskegon, has several summer resorts and is used by small recreational craft. This narrow lake is about 3.5 miles long with general depths of 18 to 40 feet. It empties into Lake Michigan through a slightly winding

channel at the W end. In 1971, the controlling depth in the channel was 3 feet, but it is at times entirely closed by sandbars. The ruins of two piers protect the entrance. The N pier is almost entirely washed away, and the S pier is gone except for a double row of piles extending from a point 50 feet out in the lake to a point about 450 feet inside. The banks rise steeply from each shore.

(280) A highway bridge with a 29-foot draw span and a clearance of 12 feet crosses the inner end of the entrance channel. In 1978, it was reported that the bridge was being maintained in the closed position. A fixed highway bridge with a clearance of 18 feet crosses the lake 1.5 miles farther E.

(281) A **slow-no wake speed** is enforced in Mona Lake. A restricted navigation area for motorboats is within 100 feet of shore for 1,025 feet E of the W bridge.

Charts 14906, 14933

(282) **Grand Haven, Mich.**, is a city and harbor on the **Grand River,** 43 miles S of Little Sable Point. The towns of **Ferrysburg, Mich.,** and **Spring Lake, Mich.,** front the N side of the river. These communities are not visible from Lake Michigan because of sand dunes and hills immediately N and S of the harbor entrance. The principal commodities handled in the port are coal and sand.

(283) **Grand Haven South Pierhead Entrance Light** (43°03.5'N., 86°15.4'W.), 42 feet above the water, is shown from a red fog signal building on the outer end of the S pier; a fog signal is at the light.

Channels

(284) The dredged entrance channel leads E from deep water in Lake Michigan between parallel piers at the mouth of Grand River and upstream for about 16 miles. The outer ends of the piers are marked by lights. South Pierhead Entrance Light and an inner light on the S pier form a range useful for approaching the harbor. There is a turning basin on the S side of the channel 2.3 miles above the mouth. A side channel extends N to the deep water in Spring Lake 2.7 miles above the mouth.

(285) In May 2005, the controlling depth was 19.4 feet in the entrance and between the piers to about 0.5 mile above the mouth (except for lesser depths to 17.8 feet along the SE edge of the approach channel in about 43°03'22"N., 86°15'26"W.); thence in June-September 2006, the controlling depths were 14.7 feet (21 feet at midchannel) to about 1.4 miles above the mouth (except for shoaling to 5 feet along the W edge of the channel opposite the municipal marina and to 6.6 feet in the E side of the channel along the waterfront of the municipal marina), thence 15.2 feet in the left half and 7.3 feet in the right half of the channel to the railroad bridge at Ferrysburg; the turning basin had depths of 6.5 to 10 feet.

(286) In 1978, the controlling depths were 15 feet from the railroad bridge to the entrance channel to Spring Lake; thence in June-July 1980, 12 feet into Spring Lake; thence in October 1997, 4 feet from the Spring Lake channel to the C-Way Construction Co. gravel pits at Bass River. The channel limits from Ferrysburg to the upstream project limit are well marked by buoys. The channels are subject to shoaling.

(287) Large riprap stones have been placed along the lakesides and ends of the piers, and navigation should not be attempted close to these structures. Mooring to the piers or revetments is prohibited.

(288) The Grand River is not maintained above the junction with Bass River. Conditions are unknown, but depths probably do not exceed 2 to 3 feet at extreme low water for 23.5 miles upstream to Grand Rapids. Only small recreational craft navigate this section of the river.

(289) The lower part of Grand River has connecting shallow side channels separated from the main river by low marshy islands. Several connected bayous, or bays, have very shallow entrances with deep water inside. **South Channel,** the farthest downstream of the side channels, cuts across a bend in the river between points about 1.2 and 3.3 miles above the mouth and has a controlling depth of 3 feet.

(290) **Spring Lake,** extending N and connected to the Grand River at Ferrysburg, has depths of 19 to 42 feet except for shoaler depths at its head.

Danger

(291) The J.B. Sims Power Plant is on Harbor Island. Intake pipes on the W side of the island in the intake mode pose no threat to watercraft. The intakes have a compressed air blowback system to clear the screens. This blowback is capable of capsizing a small recreational vessel. The area is surrounded by rope barriers and is marked by signs.

Currents

(292) High-water periods on the Grand River are usually for two months during the spring. During these periods, currents may reach 3 to 5 mph. Currents up to 5 mph should be expected after periods of heavy precipitation, regardless of season.

(293) Grand Haven is a **customs station.**

Quarantine, customs, immigration, and agricultural quarantine

(294) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(295) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Coast Guard

(296) **Grand Haven Coast Guard Station** and a **Marine Safety Detachment** office are on the S side of the harbor entrance. (See Appendix A for address of the Detachment.)

Harbor regulations

(297) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Grand Haven harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(298) State regulations specify a **slow-no wake speed** on the following waters:

Grand River:

(299) – from the mouth to the junction with South Channel,

(300) – from 3,200 feet below to 1,000 feet above the CSX railroad bridge,

(301) – within 200 feet of the N shore from the junction with Spring Lake E for 4,000 feet,

(302) – within 300 feet of the S shore from the junction with Spring Lake to the upper junction with South Channel,

(303) – from the confluence with Indian Channel upstream for 3,500 feet,

(304) – in the river bend in the vicinity of Millhouse Bayou, and

(305) – for a stretch of 4,000 feet in the vicinity of Grand Valley Marina about 12 miles above the river mouth in South Channel

(306) **Pottawattomie Bayou**

(307) **Millhouse Bayou**

(308) **Spring Lake (entrance)**

(309) **Spring Lake**

(310) – adjacent to the towns of Ferrysburg and Spring Lake for vessels 26 feet in length or more, and within 200 feet of shore of these towns for vessels less than 26 feet in length

(311) **Smith Bayou**

(312) **Pettys Bayou**

Structures across Grand River to Grand Rapids
**Miles above South Pierhead Entrance Light*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Main Channel Junction with South Channel		1.38					
1	CSX Transportation, Inc bridge	Railroad	2.80	60	61		9	Swing. Note 1.
2	U.S. Route 31 bridge	Highway	2.89			155	25	Bascule. Note. 1.
3	Overhead cable	Power	2.94				133	
	Junction with mouth of Spring Lake		3.04					
4	Overhead cable	Power	6.45				90	
5	Overhead cable	Power	12.60				80	
	Junction with Bass River		17.38					
6	Overhead cable	Power	17.40				53	
7	Overhead cable	Power	19.39				74	
8	68th Ave. bridge	Highway	19.40	76	76	76	22	Fixed.
9	Bridge St. Rd. bridge	Highway	25.20	85	85		19	Fixed.
10	Overhead cable	Power	25.21				39	
11	Grandville bridge	Highway	33.90	69	69		24	Fixed.
12	Overhead cable	Power	37.20				43	
13	ConRail bridge	Railroad	37.20		54		17	Swing. Note 2.
14	Overhead cable	Power	39.22				40	
15	Overhead cable	Power	39.26				50	
16	Overhead cable	Power	39.31				80	
17	Overhead cable	Power	39.33				40	
18	Overhead cable	Power	39.36				80	
19	Overhead cable	Power	39.48				80	
20	Overhead cable	Power	39.50				70	
21	Michigan Ry. bridge	Railroad	39.50	70	70		27	Swing. Navigable channel through right draw. Note 2.
22	Overhead cable	Power	39.52				70	
23	Overhead cable	Power	39.79				59	
24	Wealthy St. bridge	Highway	39.80		70		19	Swing. Note 2.
25	CSX Transportation, Inc. bridge	Railroad	39.90		70		19	Swing. Note 2.
26	Fulton St. bridge	Highway	40.00					Head of navigation.
	South Channel							
	Junction with Main Channel		1.38					
27	Overhead cable		1.83					Data not available.
28	Third St. bridge	Highway	1.84			23	9	Fixed.
29	Overhead cable		1.85					Data not available.
30	Overhead cable		1.92					Data not available.

Structures across Grand River to Grand Rapids
Miles above South Pierhead Entrance Light
****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
31	Overhead cable		2.00					Data not available.
32	CSX Transportation, Inc bridge	Railroad	2.01				9	Fixed.
33	Overhead cables		2.16					Data not available.
34	U.S. Route 31 bridge	Highway	2.25				17	Fixed.
35	Overhead cable	Power	2.26				49	
36	Overhead cable		2.32					
	Junction with Main channel		2.87					
	Spring Lake Channel							
	Junction with Main channel		3.04					
37	Route 104 bridge	Highway	3.15			111	35	Fixed.
38	Overhead cable	Power	3.21				113	

Note 1.–See **33 CFR 117.1 through 117.59 and 117.633**, chapter 2, for drawbridge regulations.

Note 2.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

(313) **Cornelius Bayou**

(314) **Stahl Bayou**

(315) Local harbor regulations are under the control of the city manager and enforced by the **harbormaster.** Copies of the regulations can be obtained from the City Manager, City Hall, 519 Washington Street, Grand Haven, Mich. 49417.

Wharves

(316) Grand Haven has several deep-draft facilities in the lower 2 miles of Grand River. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(317) **J.B. Sims Power Plant Dock:** E side of river just above junction with South Channel; 437-foot face; 17 feet alongside; deck height, 6 feet; open storage for 70,000 tons of coal; receipt of coal; owned and operated by City of Grand Haven, Board of Light and Power.

(318) **Construction Aggregates Corp. Wharf:** W side of river 0.5 mile above South Channel; 350 feet of berthing space along dolphins; 20 feet alongside; deck height, 7 feet; vessel loading conveyor, rate 3,200 tons per hour; shipment of sand; owned and operated by Construction Aggregates Corp.

(319) **Verplanks Coal and Dock Co. Wharf:** N side of river 0.5 mile above Construction Aggregates Corp. Wharf; 2,200 feet of natural and improved bank; 21 feet alongside; deck height, 4 feet; open storage for 200,000 tons of material; receipt of coal and bulk aggregates; owned by Verplanks Coal and Dock Co. and operated by Verplanks Coal and Dock Co. and Grand Haven Materials Terminal.

Small-craft facilities

(320) Grand Haven has numerous small-craft facilities along both sides of Grand River, in South Channel, and in Spring Lake. The public docking facility, constructed by the city and the Michigan State Waterways Commission, is on the E side of the river just below the junction with South Channel. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, launching ramps, and harbormaster services are available in the harbor. The harbormaster monitors VHF-FM channels 16 and 9. Lifts to 50 tons are available for hull and engine repairs.

Chart 14906

(321) From Grand Haven, the shore trends S for 11 miles to Port Sheldon. This stretch is partially wooded with rolling terrain and several hills in the N part 140

to 200 feet high. There is deep water within 0.5 mile of the shore.

(322) **Port Sheldon** is a small harbor in **Pigeon Lake** 55 miles S of Little Sable Point. Pigeon Lake is connected to Lake Michigan by a entrance channel constructed by Consumers Energy Co. The channel is protected by two piers, each marked at the outer end by a private light. The primary purpose of the channel is to provide cooling water for the powerplant on the N side of the lake. In 2002, the reported controlling depth in the channel was 4.8 feet. Mariners entering the harbor do so at their own risk and are requested not to dispose of waste in Pigeon Lake. There are no public small-craft facilities in the lake. A **slow-no wake speed** is enforced in the lake. A 650-foot white stack and a lighted 400-foot red and white banded stack at the Consumers Energy Co. on the N side of Pigeon Lake are prominent.

(323) From Port Sheldon, the shore trends S for 8.8 miles to the Holland Harbor entrance. Sand bluffs are close to shore, and deep water is within 0.5 mile of shore.

Charts 14906, 14932

(324) **Holland Harbor**, 63 miles S of Little Sable Point, is formed by **Lake Macatawa,** which is connected to Lake Michigan at its W end by an improved channel. The lake extends 5 miles E to its head at the mouth of **Macatawa River** and has a least width of 1,000 feet near its midlength. The width increases to over 1 mile in the vicinity of **Big Bay** and **Pine Creek Bay,** two large indentations in the N shore of the lake. The city of **Holland, Mich.,** fronts the E shore and much of the S shore of the lake. **Macatawa, Mich.,** is a small resort community on the SW side of the lake. The principal commodities handled in the port are coal, salt, cement, stone, and agricultural chemicals.

(325) **Holland Harbor North Breakwater Light** (42°46.4'N., 86°13.0'W.), 27 feet above the water, is shown from a white cylindrical tower with a green band on the outer end of the breakwater.

Channels

(326) The dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters and through an outer basin and revetted channel to Lake Macatawa. The outer and inner ends of the breakwaters are marked by lights. The channel, well marked by buoys, continues across the lake to a turning basin off Holland at the E end of the lake. From the NE side of the basin, the channel leads into the mouth of Macatawa River. Lights mark the outer edges of shoals that extend from shore into the lake.

(327) In April 2006, the controlling depths were 20.4 feet in the entrance and through the outer basin to Lake Macatawa (except for lesser depths to 16 feet along the edges of the channel); thence in March-September 2006, 19.9 feet to Superior Point with lesser depths to 18.7 feet along the edges of the channel, thence 18.9 feet to the turning basin with lesser depths to 16.9 feet along the edges of the channel (except for shoaling to 15.8 feet along the N side of the channel between Buoy 9 and Buoy 11), thence 17 to 18 feet in the basin, thence 19.5 feet to the head of the project with lesser depths to 17 feet along the edges of the channel.

(328) A dredged settling basin extends 900 feet upstream from the upper limit of the project in Macatawa River. In March 2006, the basin had depths of 2 to 5 feet.

(329) The currents in the entrance channel attain velocities up to 3 mph in either direction. Mooring to the breakwaters and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(330) Outside the dredged channel, the W end of Lake Macatawa has central depths of 15 to 36 feet with much shoaler water extending from shore. In the E end of the lake, depths are 7 to 16 feet with shoals along the shore. Shoals with depths of 1 to 3 feet extend from shore on either side of the entrance to Big Bay. The S limit of the E shoal is marked by a light. Lighted and unlighted seasonal buoys mark the channel into Big Bay between the shoals. A light marks the extent of a shoal off the S shore opposite Big Bay, and a light marks a shoal off Superior Point, on the N shore at the constriction of the lake.

Anchorage

(331) Pine Creek Bay affords good anchorage for small craft in mud bottom. A special anchorage is in the SW part of Lake Macatawa. (See **33 CFR 110.1 and 110.80a,** chapter 2, for limits and regulations.)

Coast Guard

(332) **Holland Coast Guard Station** is on the N side of Lake Macatawa near the harbor entrance.

Harbor regulations

(333) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Lake Macatawa. (See **33 CFR 162.120,** chapter 2, for regulations.) State regulations specify a **slow-no wake speed** off Central Park near midpoint of the lake, off Kollen Park at the E end of the lake, and from the mouth of Macatawa River upstream to a point 1,500 feet above the River Avenue bridge.

Towage

(334) Tugs for Holland are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(335) Holland has several deep-draft facilities. The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.)

(336) **Verplank Dock Co., Holland Dock:** (42°47'27"N., 86°07'08"W.); 760-foot face with slip; 21 feet alongside; deck height, 4 to 5 feet; open storage for 75,000 tons of limestone; water and electrical connections; receipt of limestone; owned and operated by Verplank Dock Co.

(337) **Macatawa Bay Dock and Terminal Co. Wharf:** immediately NE of Verplank Dock Co., Holland Dock; 855-foot face; 22 feet alongside; deck height, 6 feet; two 50-ton crawler cranes and four 15-ton cranes; open storage for 200,000 tons of scrap metal; water connections; receipt of pig iron, shipment of scrap metal; owned by Bay Side Land Co., and operated by Macatawa Bay Dock and Terminal Co.

(338) **James DeYoung Generating Plant Dock:** NE of Macatawa Bay Dock and Terminal Co. Wharf; 1,000-foot face; 21 to 22 feet alongside; deck height, 5 feet; open storage for 160,000 tons of coal; receipt of coal; owned and operated by City of Holland, Board of Public Works.

(339) **Brewers City Dock:** NE of James DeYoung Generating Plant Dock; 850-foot face; 22 feet alongside; 120,000 tons of open storage; receipt of limestone aggregate and occasionally salt; owned and operated by Brewers City Dock, Inc.

Small-craft facilities

(340) There are numerous marinas throughout Lake Macatawa. Gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, and launching ramps are available. Several lifts to 60 tons are available for hull, engine, and electronic repairs.

Chart 14906

(341) From Holland Harbor S for 7 miles to the mouth of the Kalamazoo River, the shore is low bluffs and occasional hills 100 to 250 feet high. Deep water is within 0.5 mile of shore. A sunken barge and crane is in

Structures across Kalamazoo River to Allegan
Miles above the mouth of the river
****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
1	Overhead cables	Power	2.78				25	
2	Saugatuck-Douglas bridge	Highway	2.80	58	58		17	Fixed.
3	I–196 bridge	Highway	3.35			72	18	Twin fixed.
4	CSX Transportation, Inc. bridge	Railroad	10.80	41			13	Swing. Note 2.
5	New Richmond bridge	Highway	10.90	31	31		13	Swing. Note 2.
6	Allegan Dam bridge	Highway	26.10					Fixed. Note 1.
7	Huggins bridge	Highway	33.90	42	42	42	8	Fixed.
8	CSX Transportation, Inc. bridge	Railroad	37.50	32	35		8	Swing. Note 2.
9	Allegan bridge	Highway	37.80			126	19	Fixed.

Note 1.–Bridge crosses the dam. Boats must portage around the dam.

Note 2.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

35 feet of water 0.6 mile offshore 3.8 miles S of Holland. Depth over the wreck is unknown.

(342) **Saugatuck Harbor,** 70 miles S of Little Sable Point, is formed by a dredged entrance channel and the lower part of the **Kalamazoo River.** The dredged entrance is 0.75 mile N of the original natural river mouth. A radar dome on Mount Baldhead, about 1 mile S of the entrance, is prominent.

Channels

(343) In its lower 2 miles, the Kalamazoo River is from 200 to 500 feet wide. For the next 0.75 mile, the river widens to 2,000 feet and is known as **Kalamazoo Lake.** At the upper end of the lake, the river narrows again to 500 feet. The village of **Saugatuck, Mich.,** is on the N side of Kalamazoo Lake and the E side of the river below the lake. **Douglas, Mich.,** is a village on the S side of the lake.

(344) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers and revetments through the mouth of Kalamazoo River and thence upstream for about 2.1 miles to Saugatuck at the N end of Kalamazoo Lake. The outer ends of the piers are marked by lights, and the channel is marked by buoys. A fog signal is at the S pierhead light.

(345) In March-May 2004, the controlling depth was 11.6 feet in the entrance channel and between the piers and revetments to the head of the project at Saugatuck. The channel between the piers and revetments must be dredged frequently, as it tends to shoal after storms. Currents in the channel attain velocities up to 3 mph in either direction.

(346) Mooring to the piers and revetments is prohibited.

(347) An 8-foot channel was dredged through the upper part of Kalamazoo Lake in 1965, but in 1978, only a meandering channel remained.

(348) From Saugatuck to Calkins, about 24 miles upstream, the river is from 100 to 150 feet wide and affords, at low water, a narrow and crooked channel for boats drawing not more than 2½ feet. The Allegan Dam at Calkins, does not have a lock, and boats must be portaged around it. The pool above the dam extends to Allegan and has a controlling depth of about 5 feet.

Caution

(349) Submerged pilings of the old piers at the former entrance of the river extend into the lake about 200 feet and are marked by a buoy. Navigation should not be attempted close to these structures.

Harbor regulations

(350) Federal regulations specify a **speed limit** of 8 mph (7 knots) in Saugatuck Harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) State regulations specify a **slow-no wake speed** from the river mouth upstream to Kalamazoo Lake.

Small-craft facilities

(351) There are several marinas at Saugatuck and at Douglas. Gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, marine supplies, and launching ramps are available. Hoists to 30 tons can handle 60-foot craft for hull and engine repairs.

Cable ferry

(352) A cable ferry crossing the Kalamazoo River 2 miles above the mouth is propelled by hauling a submerged chain which is worked around a hand capstan on the ferry. Vessels should avoid passing within 30 feet of the bow or stern of the ferry. Passage on its stern is preferred.

(353) From Saugatuck Harbor for 19 miles S to South Haven, the shore is generally bluff with some steep clay banks. A boulder ledge with depths of 24 to 28 feet at the outer edge extends 1 mile offshore from 1.5 to 3.5 miles S of Saugatuck Harbor entrance. S of this area, deep water is within 0.6 mile of shore, but scattered boulders are throughout the stretch, and small craft should keep well clear of the shore.

(354) **South Haven, Mich.,** is a city and harbor at the mouth of the **Black River,** 88 miles S of Little Sable Point. The harbor is a base for recreational craft and local fish tugs. Two lighted radio masts 1 mile NE of the river mouth are prominent.

(355) **South Haven South Pierhead Light** (42°24.1'N., 86°17.3'W.), 37 feet above the water, is shown from a red conical tower on the outer end of the S pier; a fog signal is at the light.

Channels

(356) The dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of Black River. The outer ends of the piers are marked by lights. In July 2006, the controlling depth was 9.4 feet in the entrance and between the piers to the head of the project just below the Dyckman Avenue bridge. Mooring to the piers and revetments is prohibited.

(357) Above the dredged channel, the Black River is navigable by small craft to the vicinity of the fixed highway bridge about 2.6 miles above the entrance.

Currents

(358) Currents in the river attain velocities up to 3 mph.

Bridges

(359) A bascule highway bridge with a clearance of 10 feet crosses Black River just above the head of the dredged channel. (See **117.1 through 117.59 and 117.624,** chapter 2, for drawbridge regulations.) An overhead cable with unknown clearance crosses the river 1.9 miles above the entrance. Fixed highway bridges about 2.2 and 2.6 miles above the entrance have clearances of 14 and 36 feet, respectively.

Coast Guard

(360) **South Haven Coast Guard Station,** operated on weekends during the boating season only, is on the N side about 300 yards E of the entrance to Black River. A radio guard is usually maintained during daylight hours on holidays and weekends.

Harbor regulations

(361) Federal regulations specify a **speed limit** of 8 mph (7 knots) in South Haven harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) A **slow-no wake speed** is enforced in the harbor.

Small-craft facilities

(362) A public docking facility constructed by the city and the Michigan State Waterways Commission is on the N side of the river 0.5 mile above the mouth. A private marina is adjacent to the public dock and several marinas are above the Dyckman Avenue bridge. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A 25-ton hoist is available for engine repairs and hull and electronic repairs are available from local firms.

Chart 14905

(363) From South Haven SSW for 22 miles to St. Joseph and Benton Harbor, the shore is skirted by low bluffs for the first 5 miles and higher bluffs in the remainder of the stretch. Deep water is within 0.5 mile of shore. The Palisades Nuclear Power Plant, 6 miles SSW of South Haven, is prominent. A **security zone** has been established in the waters of Lake Michigan off the Palisades Nuclear Power Plant. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.)

Charts 14905, 14930

(364) The **St. Joseph River** flows into Lake Michigan 22 miles SSW of South Haven and 107 miles S of Little Sable Point. The port cities of **St. Joseph, Mich.,** and **Benton Harbor, Mich.,** are on the W and E sides of the river, respectively. The principal commodities handled in the harbor are gravel and cement.

Prominent features

(365) A blue cupola about 0.8 mile ESE of St. Joseph North Pierhead Light and a lighted white tank with St. Joseph written on it, 1,100 feet NNE of the cupola, are prominent.

(366) **St. Joseph North Pierhead Light** (42°07.0'N., 86°29.7'W.), 31 feet above the water, is shown from a white cylindrical tower on the outer end of the N pier; a fog signal is at the light. This light is sometimes obscured by city lights in the background.

Channels

(367) A dredged entrance channel leads from deep water in Lake Michigan between parallel piers through the mouth of St. Joseph River upstream for about 1 mile to the junction with **Paw Paw River.** The outer ends of the piers are marked by lights, and the N pier has an inner light. Turning basins are on the N side of the channel just below the junction with Paw Paw River and on the SE side of the channel below the Twin Cities Bicentennial Bridge. A canal extends through the mouth of the Paw Paw River and continues E to Riverview Drive.

(368) In 2004-May 2006, the controlling depths were 20.5 feet in the entrance channel and between the piers to the CSX Railroad bridge (except for lesser depths to 18.4 feet along the edges of the channel between the piers, shoaling to 6.5 feet in the right outside quarter of the channel just NW of the Waterfront marina entrance, and lesser depths to 14.3 feet in the right half of the channel just below the CSX Railroad bridge), thence 6.9 feet (16.6 feet at midchannel) to Morrison channel on the S side of the river, thence 11.0 feet to Paw Paw River, thence 8.8 feet to the head of the project at Riverview Drive. The turning basins had depths of 11 to 14 feet on the N side of the channel and 7 to 11 feet on the SE side of the channel. The canal and the area of the junction of St. Joseph and Paw Paw Rivers are subject to shoaling.

(369) Currents in the river attain velocities up to 3 mph.

(370) Navigation should not be attempted close to the piers due to stone riprap. Mooring to the piers and revetments is prohibited.

(371) Above the dredged channel, the St. Joseph River turns S and flows between St. Joseph on the W bank and the city of Benton Harbor on the E bank. In 1980, this reach had depths of 6 to 20 feet in the best channel, generally near the E bank. Small islands near midstream in this reach are sometimes submerged during high water conditions. Depths of 2 to 3 feet can be carried for about 7 miles above St. Joseph. The river is obstructed by dams at Berrien Springs, about 22 miles above St. Joseph.

(372) **Morrison Channel** cuts across the S turn in the St. Joseph River leaving the river about 1 mile above the pierheads and rejoining it about 2.5 miles above the pierheads. The channel is separated from the river channel by **Marina Island.** In 1971, Morrison Channel had a centerline controlling depth of 6 feet.

(373) Above the dredged channel in the Paw Paw River, the crooked channel is navigable by small craft for about 2 miles to the Paw Paw Avenue bridge. In 1968, the centerline controlling depth was 1 foot.

Coast Guard

(374) **St. Joseph Coast Guard Station**, marked by a light, is near the inner end of the N pier.

Towage

(375) Tugs are available from Sault Ste. Marie, Chicago, and Milwaukee. (See Towage under these sections.)

Harbor regulations

(376) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(377) Harbor regulations for the city of St. Joseph are enforced by the **harbormaster** and copies may be obtained from City Manager, City Hall, City of St. Joseph, St. Joseph, Mich. 49085.

(378) Harbor regulations for the city of Benton Harbor are enforced by the **harbormaster,** who is the chief of police. Copies of the regulations may be obtained from the Chief of Police, 200 Wall Street, Benton Harbor, Mich. 49022.

Wharves

(379) St. Joseph and Benton Harbor have several deep-draft facilities along the dredged section of the St. Joseph River. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(380) **Lafarge Corp. Dock:** N side of river just above CSX railroad bridge; 560-foot face; 10 to 25 feet alongside; deck height, 5 feet; vessels unload through a 10-inch pipeline; water connections; receipt of cement; owned and operated by Lafarge Corp.

(381) **McCoy Concrete Dock:** S side of river 300 feet below Main Street/Interstate 94 bridge; 800-foot face; 19 feet alongside; deck height, 4 feet; open storage for 140,000 tons of stone and 40,000 tons of salt; receipt of limestone and salt; owned and operated by McCoy Concrete, Inc.

(382) **Consumers Asphalt Co. Dock:** (42°06'47"N., 86°28'16"W.); 700-foot face; 21 feet alongside; deck height, 5 feet; open storage for 6,000 tons of stone; receipt of limestone and salt; owned and operated by Consumers Asphalt Co.

Structures across St. Joseph River to Paw Paw River
**Miles above North Pierhead Light*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	St. Joseph River							
1	CSX Transportation, Inc. bridge	Railroad	0.67	91	100		12	Swing. Note 1.
2	Blossomland (M–63) Bridge	Highway	0.92			100	36	Bascule. Note 2.
3	Overhead cable		1.27				67	
4	Twin Cities Bicentennial Bridge (Main St./I–94 Bus.)	Highway	1.30			100	19	Bascule. Note 2.
5	Overhead cable	Power	1.52				76	
6	Napier Ave. bridge	Highway	3.11			166	28	Fixed.
7	Overhead cables	Power	5.11				57	
8	Overhead cables	Power	5.70				54	
9	I–94 bridge	Highway	5.90	78	78		20	Fixed. 7 spans
10	Overhead cables	Power	6.30				54	
11	Somerleyton bridge	Highway	6.60	124	94		18	Fixed. Navigable channel through right opening.
	Morrison Channel							
12	Overhead cables	Power	1.17				57	
13	Wayne St. (I–94) bridge	Highway	1.19			90	36	Fixed.
14	Overhead cable	Power	1.46				56	
15	Overhead cable	Power	1.76				57	
16	Overhead cable	Power	1.92				63	
	Paw Paw River							
17	Overhead cable	Power	1.49				38	
18	Overhead cable		1.50					Data not available.
19	CSX Transportation, Inc. bridge	Railroad	1.51			45	6	Fixed.
20	Overhead cables	Power	1.57				31	
21	Overhead cables	Telephone	2.02				27	
22	Klock Rd. bridge	Highway	2.05			53	9	Fixed.
23	North Shore Rd. bridge	Highway	2.57			39	9	Fixed.
24	Overhead cable		2.58					Data not available.
25	Paw Paw Ave. bridge	Highway	3.15			45	11	Fixed.
26	Overhead cable		3.15					Data not available.
27	Overhead cable		3.17					Data not available.
28	CSX Transportation, Inc. bridge	Railroad	3.18				8	Fixed.
29	Overhead cable		3.19					Data not available.

Note 1.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 2.–See **33 CFR 117.1 through 117.59 and 117.651**, chapter 2, for drawbridge regulations.

Small-craft facilities

(383) A public docking facility developed by the Michigan State Waterways Commission is just E of the Coast Guard Station. Transient berths, water, electricity, sewage pump-out, and harbormaster services are available. Several privately operated marinas are in the river and in Morrison Canal.

Chart 14905

(384) From the mouth of St. Joseph River, the shoreline trends SSW, thence SW, for about 35 miles to Michigan City. The shore in this stretch is a moderate bluff for the first 7 miles, thence a range of 200- to 400-foot hills for next 8 miles, and thence low bluffs for the next 20 miles to Michigan City. Deep water is within 0.6 mile of shore. The Donald C. Cook Nuclear Plant, 10 miles SSW of St. Joseph, is prominent. A security zone has been established in the waters of Lake Michigan off the Donald C. Cook Nuclear Plant. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.)

(385) **New Buffalo, Mich.,** is a small-craft harbor about 25 miles SW of St. Joseph and about 10 miles NE of Michigan City.

Channels

(386) A dredged entrance channel leads E from deep water in Lake Michigan between converging breakwaters, thence SE to the mouth of the **Galien River** and upstream for about 0.2 mile. The outer ends of the breakwaters are marked by lights. Private, seasonal buoys mark shoaling near the S channel edge in the approach to the harbor, just inside the breakwaters. In May 2006, the controlling depth was 6.3 feet through the entrance and to the mouth of the Galien River.

(387) The outer basin enclosed by the breakwaters has an area of about 6 acres; it is not adapted for anchorage of vessels, but reduces wave action in the lower section of the river. Mooring to the breakwaters is prohibited. Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

Structures across Trail Creek
***Miles above West Pierhead Light**
****Clear width in feet proceeding upstream**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
1	Franklin St. bridge	Highway	0.50			120	17	Bascule. Note 1.
2	Amtrak bridge	Railroad	0.85	41	44		7	Swing. Note 2.
3	Second St./U.S. 12 bridge	Highway	1.00			120	46	Fixed.
4	Sixth St. bridge	Highway	1.19			69	10	Bascule. Note 1.
5	Overhead cable	Highway	1.33					Data not available.
6	Overhead cable		1.48					Data not available.
7	E St. bridge	Highway	1.49					Fixed. Head of navigation.

Note 1.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 2.–See **33 CFR 117.1 through 117.59 and 117.401**, chapter 2, for drawbridge regulations.

Small-craft facilities

(388) The harbor was developed by the Michigan State Waterways Commission. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps are available. Hoists to 30 tons are available for complete marine repairs.

(389) The **State boundary** between Michigan and Indiana is about 4.5 miles SW of New Buffalo entrance. **Central Standard Time** is observed on the lakeshore areas of Indiana and in the States of Illinois and Wisconsin.

Charts 14905, 14926

(390) **Michigan City, Ind.**, is a small-craft and fishing harbor at the mouth of **Trail Creek,** 35 miles SSW of St. Joseph and 38 miles SE of the mouth of the Chicago River.

Prominent features

(391) A cooling tower and the tallest of four stacks, S and SSE of the harbor entrance respectively, are prominent.

(392) **Michigan City East Pierhead Light** (41°43.7'N., 86°54.7'W.), 55 feet above the water, is shown from a white octagonal tower with a red roof and an attached building on the outer end of the E pier; a fog signal is at the light.

Channels

(393) The entrance to Trail Creek is protected on the W by a detached breakwater. A dredged entrance channel leads S from deep water in Lake Michigan past the E end of the breakwater, turns SE, then S again between two piers at the mouth of the creek. The ends of the detached breakwater and the outer ends of the piers are marked by lights. Inside the creek, the channel leads upstream for about 1.3 miles to the E Street bridge. Turning basins are in the channel bend below the Franklin Street bridge and on the SW side of the channel in Trail Creek just above the Second Street bridge. A small-craft basin, on the NE side of the entrance channel, is entered through a cut in the E pier.

(394) In April 2002, the controlling depths were 3.3 feet (3.6 feet at midchannel) between the breakwaters to the first turning basin, thence 6.1 feet in the turning basin, thence 2.1 feet to the E Street bridge. In 1991, the second turning basin had a controlling depth of 2½ feet in the N part decreasing to about ½ foot towards the S part. In April 1999, the small-craft basin had controlling depths of 12 feet in the N part and 8 feet in the S part.

(395) The piers and breakwaters are riprapped with large stones on all water sides. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Caution

(396) Strong NNW winds may cause large swells in the outer harbor and the entrance channel. Under heavy sea conditions, small craft are advised to use extreme caution when transiting this area.

Coast Guard

(397) **Michigan City Coast Guard Station** is on the E side of the harbor entrance.

Harbor regulations

(398) A **speed limit** of 8 mph (7 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local regulations have been established by the city of Michigan City and are enforced by a **harbormaster.** Copies of regulations may be obtained from the harbormaster's office at Washington Park Marina, just E of the Coast Guard Station.

Small-craft facilities

(399) The municipal marina on the E side of the entrance channel provides transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, and launching ramps. Marine supplies and hoists to 50 tons for hull, engine, and electronic repairs are available at several marinas in the lower mile of Trail Creek.

(400) From Michigan City SW for about 23 miles to Gary, the shore is bordered by 100- to 200-foot hills, and deep water is within 0.5 mile. An obstruction, covered ½ foot, is close to shore 1.5 miles SW of the mouth of Trail Creek.

(401) The S end of Lake Michigan is fully exposed to storms from the N, the fetch being about 300 miles. All severe storms from NW to NE create hazardous conditions, including powerful and dangerous seas, and strong currents running E to W or W to E, depending on the prevailing winds. An added unfavorable condition is found in the sandy nature and gentle slope of the lake bottom, depths of 70 feet occurring 8 to 10 miles from shore.

(402) **Indiana Dunes National Lakeshore** is at the S end of Lake Michigan, generally between Michigan City and Gary, Indiana. The Lakeshore was authorized in 1966 and formally established within the National Park Service in 1972. Rules and regulations in **36 CFR 31** and Indiana State laws governing the Lakeshore area are enforced by National Park Service personnel on Federally owned lands. Copies of the Federal Regulations are generally available in major libraries.

(403) The National Park Service does not provide facilities for boaters at this time. Although the land acquisition program is nearly complete, not all sections of land to be included in the Park have actually been

acquired to date. All mariners are advised that portions of the shore area remain as private property and occupancy in any manner may constitute trespassing on private property.

(404) Certain portions of the shore have been designated as swimming beaches; these areas are closed to boats and are marked by buoys during the swimming season.

(405) **Burns International Harbor,** 14 miles SW of Michigan City, is an artificial harbor formed by a breakwater extending lakeward from the shore and turning E to enclose a harbor basin and two dredged arms which extend S from the basin into the shoreline. The harbor is entered SW from deep water in Lake Michigan on the S side of the breakwater. The N and S sides of the harbor entrance are marked by lights.

(406) In June 2005, the controlling depths were 27.5 feet in the entrance channel to the Outer Basin, thence 24.1 feet in the basin, thence 23.5 feet in the West Harbor Arm and 23.1 feet in the East Harbor Arm.

(407) The Indiana Port Commission has constructed a bulkhead and fill in the area between East Harbor Arm and West Harbor Arm, and Bethlehem Steel Corporation has constructed a bulkhead and fill that extends about 1 mile E of the harbor entrance. These bulkheads are riprapped with stone. Mariners are advised to exercise caution when navigating in this area.

Dangers

(408) A submerged pipe, covered 1½ feet, has been reported about 125 feet N of the light marking the N side of the harbor entrance.

Towage

(409) Tugs to 1,640 hp are available at Burns International Harbor from Great Lakes Towing Co. (800-321-3663) or from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.) At least 3 hours advance notice is requested.

Harbor regulations

(410) Local regulations are established and enforced by the Indiana Port Commission. Copies of the regulations can be obtained from Burns International Harbor, 6600 U.S. Highway 12, Portage, Ind. 46368.

Radio facility

(411) The Indiana Port Commission operates a radio facility on VHF-FM channels 16, 10, 12, and 68, call sign, KVF 866. Communication with commercial and pleasure craft provides improved traffic control, and in conjunction with the State Police patrol boat, improved harbor security.

Wharves

(412) Burns International Harbor has deep-draft facilities in East and West Harbor Arms. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the Indiana Port Commission or the operator.) Water and electrical shore-power connections are available at most berths in the harbor.

Facilities in West Harbor Arm:

(413) **Midwest Steel, Barge Dock:** inner end of W side; 684-foot face; 27 feet alongside; deck height, 6 feet except 13 feet for center 300-foot section; open storage for 300,000 tons of steel products; cranes to 110 tons; receipt of coiled steel and shipment of steel products; owned and operated by Midwest Steel Division National Steel Corp.

(414) **Indiana Port Commission, Berth 5:** S end of arm; 600 feet of berthing space along dolphins; 27 feet alongside; deck height, 13 feet, 6 acres open storage; rental equipment available; receipt of stone, coal, and miscellaneous bulk materials by self-unloading vessels; conveyor to potash storage at rear, rate, 2,000 tons per hour; owned by Indiana Port Commission and operated by Indiana Port Commission and Domtar, Inc.

(415) **Indiana Port Commission, Berths 1, 2, 3, and 4:** inner end of E side; 1,800-foot face; 27 feet alongside; deck height, 13 feet; 118,000 square feet covered storage; 10 acres open storage; cranes to 150 tons; receipt and shipment of steel and general and containerized cargo; owned by Indiana Port Commission and operated by Indiana Port Commission and Ceres Marine Terminals, Inc.

Facility in the harbor basin:

(416) **Indiana Port Commission, Cargill Dock:** S side of basin between East and West Harbor Arms; 610 feet of berthing space with dolphins; 27 feet alongside; deck height, 13 feet; 4¼-million-bushel grain elevator; vessel loading spout, 90,000 bushels per hour; shipment of grain; owned by Indiana Port Commission and operated by Cargill, Inc.

Facilities in East Harbor Arm:

(417) **Indiana Port Commission, Berths 6 and 7:** inner end of W side; 1,280-foot face; 27 feet alongside; deck height, 13 feet; 13 acres open storage; tank storage for 4¾ million gallons; cranes to 150 tons; receipt and shipment of blast furnace slag, steel, liquid fertilizer, liquid caustic soda, and miscellaneous bulk materials;

owned by Indiana Port Commission and operated by various operators.

(418) **Indiana Port Commission, Berth 8:** S end of arm; 360-foot face; 27 feet alongside; deck height, 13 feet; 2 acres open storage; tank storage for 2¾ million gallons; cranes to 150 tons; receipt and shipment of steel products, liquid fertilizer, liquid caustic soda, and miscellaneous bulk materials; owned by Indiana Port Commission and operated by various operators.

(419) **Bethlehem Steel Corp., Burns Harbor Plant Dock:** E side of arm; 3,742-foot face; 27 feet alongside; deck height, 14 feet; 25 acres open storage; two 20-ton bucket unloaders, maximum rate 1,800 tons per hour for iron ore pellets; receipt of iron ore pellets and limestone, shipment of steel mill products; owned and operated by Bethlehem Steel Corp.

(420) **Portage-Burns Waterway** is a drainage canal about 2 miles SW of the entrance to Burns International Harbor. A small-craft harbor at the mouth of the waterway is protected on the NE side by a jetty and on the N and W sides by breakwaters. The outer ends of the breakwaters are marked by lights. The waterway extends inland from the small-craft harbor for about 1.5 miles to connect with Little Calumet River.

(421) A dredged entrance channel leads E between the outer ends of the breakwaters, turns S through the small-craft harbor, and continues inland for about 1 mile. In August 1995, the controlling depths were 3½ feet in the entrance channel, thence 3 feet in the channel through the small-craft harbor and in the dredged inland section of the waterway. Dangerous shoals form rapidly in the dredged sections of the waterway, and mariners are advised to navigate the waterway with extreme caution.

(422) The waterway is crossed by bridges and overhead cables and pipelines, all of unknown clearance.

(423) A marina on the W side of Portage-Burns Waterway about 0.8 mile above the entrance provides transient berths, gasoline, water, electricity, sewage pump-out, limited marine supplies, a launching ramp, and a 12-ton hoist.

Charts 14905, 14926, 14927

(424) **Gary Harbor** is a private harbor at the S extremity of Lake Michigan, about 22 miles SW of Michigan City and 14 miles SE of Calumet Harbor entrance. The entirely artificial harbor was developed and is owned by United States Steel Corp.

Channels

(425) The harbor comprises a channel extending S into the shoreline for about 1 mile between parallel piers to a turning basin. The entrance to the channel is protected by a breakwater extending generally NE from the W side of the entrance. The outer end of the breakwater and outer ends of the piers are marked by private lights. A fog signal is at the breakwater light. A bulkhead, enclosing a fill area along the shore, extends 1.8 miles E from the E side of the channel entrance and is marked at its E end by a light. An unmarked shoal extends about 400 yards NNE of the E entrance point.

(426) Depths in the channel are maintained to at least 27 feet. Just inside the entrance, the channel is crossed by an overhead pipeline with a clearance of 125 feet and an overhead power cable with a clearance of 132 feet. About 0.65 mile above the entrance, the channel is crossed by an overhead conveyor with a clearance of 125 feet.

Towage

(427) Tugs are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(428) United States Steel Corp. operates deep-draft berths along both sides of the channel at Gary Harbor. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for these berths are reported depths. (For information on latest depths, contact the operator.)

(429) **West Dock:** 5,280 feet of berthing space; 27 to 31 feet alongside; deck height, 11 feet; open storage for over 4 million tons of material; four hulett-type unloaders, 600 tons per hour each; receipt of iron ore, iron ore pellets, and limestone.

(430) **East Dock:** 4,352 feet of berthing space; 27 to 29 feet alongside; deck height, 11 feet; open storage for 500,000 tons of material; cranes to 100 tons; receipt of limestone and dolomite, shipment of scrap metal and steel mill products.

Charts 14905, 14926, 14927, 14929

(431) From Gary Harbor to Wilmette, Ill., 36 miles NW, the SW shore of Lake Michigan is developed with extensive private commercial facilities, public utilities, marinas, and yacht clubs.

(432) **Buffington Harbor,** a private harbor owned by the Lehigh Portland Cement Co., is about 3 miles SE of

Indiana Harbor and 4.5 miles NW of Gary Harbor. The harbor is built in the lake in front of the company's plant on bulkheaded and filled land that extends 2,400 to 2,900 feet beyond the natural shoreline.

Channels

(433) The harbor basin is protected on the W and N sides by a breakwater that extends from the shore W of the wharf; the wharf forms the E side of the basin. The outer end of the breakwater is marked by a private light; a wave gauge is about 500 feet N of the light. The basin has been dredged to 26 feet, but the depths gradually decrease to about 12 feet along the breakwater on the W side of the harbor. A breakwater extends from the W breakwater and from the S shore of the harbor forming a protected inner basin at the SW corner of the harbor.

(434) From the NE end of the wharf, the entire shoreline for about 4.5 miles SE to Gary Harbor has been bulkheaded and filled.

(435) The wharf on the E side of the basin provides 2,128 feet of berthing space with dolphins and a deck height of 8 feet. The reported depth alongside is 20 to 28 feet. There is open storage for about 1¼ million tons of material, and a retractable conveyor can load vessels with slag at 1,000 tons per hour. Limestone, bauxite, cement clinker, and bulk materials are received, and slag and miscellaneous bulk materials are shipped.

Towage

(436) Tugs are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago.) Harbor.)

(437) **Indiana Shoals,** an extensive bank in the approaches to Indiana Harbor and Calumet Harbor, extends about 5 miles NE from the outer end of the fill area which forms the E side of the entrance to Indiana Harbor. The bank has several ridges with depths of 15 to 18 feet near its inner end, and has depths of 22 to 30 feet near its outer end. A lighted gong buoy marks the E side of the bank.

(438) A wreck, covered 21 feet, is N of Indiana Shoals, 6.2 miles NE of the entrance to Indiana Harbor. The wreck is marked on the W side by a buoy.

(439) **Indiana Harbor,** an artificial harbor at **East Chicago, Ind.,** is about 3 miles NW of Buffington Harbor and 6 miles SE of Calumet Harbor. The harbor has an outer basin which is entered from N and is enclosed by bulkheaded fill areas that extend 2.6 miles NE from the natural shoreline. The outer corners of the bulkheads are marked by private lights. The fill area S and E of the basin is occupied by Inland Steel Co., and the area W of the entrance channel and basin is occupied by LTV Steel Co. The inner harbor is formed by a dredged canal that extends SW from the outer basin into the shoreline.

(440) **Indiana Harbor East Breakwater Light** (41°40'51"N., 87°26'28"W.), 78 feet above the water, is shown from a square tower on the E side of the entrance channel; a seasonal fog signal is at the light.

Channels

(441) The dredged entrance channel leads SSE from deep water in Lake Michigan between breakwaters to an outer harbor basin. The entrance channel is marked by lights on the outer and inner ends of the breakwaters. From the outer harbor basin, a canal entrance channel extends SW to **Indiana Harbor Canal,** which continues SW for 1.4 miles to a turning basin at **The Forks.** The entrance to the canal is marked by lights. The channel width in the canal is restricted by the clear width of the bridge span openings of 61.7 feet. From The Forks, **Calumet River Branch** extends S for about 0.4 mile to just below Columbus Drive bridge, and **Lake George Branch** extends W for about 0.6 mile.

(442) In August 1990, the controlling depths were 23 feet at midchannel in the entrance channel, thence 19 feet in the outer harbor basin and in the entrance channel to Indiana Harbor Canal, thence 11 feet at midchannel through the canal, thence 10 feet in the turning basin at The Forks, thence 5½ feet in the Calumet River Branch, and thence, in Lake George Branch, 13 feet at midchannel to the W end.

(443) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Caution

(444) A floating oil boom is permanently moored across Lake George Branch just above the dredged channel.

Towage

(445) Tugs for Indiana Harbor are available from Calumet (South Chicago Harbor. (See Towage under Calumet (South Chicago) Harbor.)

Wharves

(446) Indiana Harbor has numerous deep-draft facilities in the outer basin, along both sides of Indiana Harbor Canal, and in the branch channels. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Some of the facilities described have

Structures across Indiana Harbor Canal
**Miles above Indiana Harbor Outer Basin*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Main Channel							
1	Elgin, Joliet & Eastern Ry. bridge	Railroad	0.68			61	8	Bascule. Note 1.
2	Overhead cables		0.68				199	
3	CSX RR bridge	Railroad	0.70			66	8	Bascule. Note 1.
4	ConRail bridge	Railroad	0.71			65	7	Bascule. Note 1.
5	ConRail bridge	Railroad	0.72			65	7	Bascule. Note 1.
6	Overhead pipeline		0.73			65	125	
7	Indian Harbor Belt RR bridge	Railroad	0.73			65	7	Bascule. In permanent open position.
8	Overhead cable	Power	1.20				110	
9	Dickey Road bridge	Highway	1..21			118	18	Bascule. Notes 1, 2 and 4.
10	Overhead cable		1.23				145	
11	Cline Avenue (S912) bridge	Highway	1.61			230	100	Fixed.
12	Overhead cables	Power	1.86				140	
13	Canal St. bridge	Highway	1.88			65		Bridge leaves removed. Note 3.
14	Elgin, Joliet & Eastern Ry. bridge	Railroad	1.89			65	5	Bascule. Note 1.
	The Forks		2.10					
	Calumet River Branch							
15	Overhead cable		2.58					Data not available.
16	Columbus Dr. bridge	Highway	2.60			41	8	Temporary trestle.
17	South Chicago & Southern and CSX RR bridge	Railroad	3.21			34	3	Fixed.
18	Chicago Ave. bridge	Highway	3.29			50	9	Fixed.
19	Indiana Harbor Belt RR bridge	Railroad	3.99			36	4	Fixed.
20	Elgin, Joliet & Eastern Ry. bridge	Railroad	4.00			52	3	Fixed.
	Lake George Branch							
21	Overhead cable		2.58					Data not available.
22	Indianapolis Blvd. bridge	Highway	2.59			68	12	Bascule. Notes 1 and 2.
23	Overhead cable		2.60				111	
24	Overhead cable		3.00					Data not available.
25	CSX RR bridge	Railroad	3.01			65	5	Fixed.
26	Overhead cable	Power	3.07				26	

Note 1.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 2.–Vertical clearance is at center of span.

Note 3.–In 1984, deteriorated abutments were reported to have reduced the horizontal clearance to about 60 feet.

Note 4.–Bridge undergoing reconstruction in 1986.

water and electrical shore-power connections, and most have highway and rail connections. Many of the facilities are used for mooring vessels during the closed navigation season.

Facilities on the N side of Indiana Harbor Canal:

(447) **LTV Steel Co., Indiana Harbor Works, Barge Dock:** outer end of canal entrance channel adjacent to outer basin; 1,009-foot face; 18 to 24 feet alongside; deck height, 7½ feet; open storage for 36,000 tons of limestone and 597,000 tons of iron ore pellets; 25-ton mobile hoist; receipt of limestone; owned and operated by LTV Steel Co., Indiana Harbor Works.

(448) **LTV Steel Co., Indiana Harbor Works, Ore Dock:** adjacent W of Barge Dock; 2,275-foot face; 20 to 25 feet alongside; deck height, 7½ feet; trough and bin storage for over 1½ million tons of material; two bucket unloaders, 600-ton-per-hour capacity each; receipt of iron ore pellets, iron ore, and limestone; owned and operated by Jones and Laughlin Steel Corp.

(449) **United States Gypsum Co. Dock:** between Elgin, Joliet, and Eastern Railway bridge and The Forks; 991-foot face; 15 to 19 feet alongside; deck height, 6 feet; self-unloading vessels moor in channel and discharge by boom to 100,000-ton capacity storage shed; receipt of gypsum rock; owned and operated by United States Gypsum Co.

Facilities in Lake George Branch:

(450) **Amoco Oil Co. Dock:** N side immediately W of The Forks turning basin; 1,430-foot face; 21 to 29 feet alongside; deck height, 6 feet; tank storage for over 2 million barrels; receipt and shipment of petroleum products; owned and operated by Amoco Oil Co.

(451) **Associated Box Corp. Dock:** immediately W of Amoco Oil Co. Dock; 377-foot face; 17 to 25 feet alongside; deck height, 6 feet; tank storage for 890,000 barrels; receipt and shipment of petroleum products; owned by Associated Box Corp. and operated by American Recovery Co., Inc., Clark Oil and Refining Corp., and Bigane Vessel Fueling Co.

(452) **Energy Cooperative Inc., East Chicago Refinery Dock:** N side above Indianapolis Boulevard bridge; 1,347-foot face; 23 to 27 feet alongside; deck height, 6 feet; storage for about 2½ million barrels; shipment of petroleum products; owned and operated by Energy Cooperative Inc.

(453) **Cy's Trucking and Transfer Co., Inc. Dock:** S side immediately W of The Forks turning basin; 600-foot face; 23 feet alongside; deck height, 9 feet; 18,000 square feet covered storage; cranes to 80 tons; receipt of steel and bulk products; owned and operated by Cy's Trucking and Transfer Co.

Facilities in Calumet River Branch:

(454) **Cities Service Co. Dock:** W side of the branch 1,000 feet below Columbus Drive bridge; 600-foot face; 15 to 19 feet alongside; deck height, 9 feet; tank storage for 4 million barrels; occasional receipt and shipment of petroleum products; owned and operated by Cities Service Co.

(455) **Mobil Oil Corp., Calumet River Branch South Dock:** W side of the branch below Columbus Drive bridge; 640-foot face; 11 to 21 feet alongside; deck height, 9 feet; tank storage for 1 million barrels; shipment of petroleum products; bunkering vessels; owned and operated by Mobil Oil Corp.

(456) **Phillips Pipe Line Co., East Chicago Terminal Dock:** E side of the branch 700 feet below Columbus Drive bridge; 600-foot face; 7 to 19 feet alongside; deck height, 8 feet; tank storage for 3¼ million barrels; shipment and occasional receipt of petroleum products; owned and operated by Phillips Pipe Line Co.

(457) **Northern Indiana Dock Co. Wharf:** E side of the branch 1,500 feet below Columbus Drive bridge; 479-foot face; 14 to 19 feet alongside; deck height, 7 feet; cranes to 60 tons; receipt and shipment of scrap metal; owned and operated by Northern Indiana Dock Co., Inc.

Facilities on the S side of Indiana Harbor Canal:

(458) **Inland Steel Co., Plant No. 3 Dock:** between ConRail bridge and Dickey Place bridge; 990-foot face; 13 to 20 feet alongside; deck height, 8 feet; storage bins and troughs for over 1 million tons of material; two bucket unloaders, combined rate 800 tons per hour; receipt of iron ore pellets and limestone; owned and operated by Inland Steel Co.

(459) **Inland Steel Co., Plant No. 2 Dock:** outer end of canal entrance channel adjacent to outer basin; 3,465-foot face; 20 to 28 feet alongside; deck height, 6 to 8 feet; storage bins for over 2 million tons of material; five unloading cranes with buckets, unloading rate 1,000 tons per hour each; receipt of iron ore, iron ore pellets, and limestone; bunkering vessels; owned and operated by Inland Steel Co.

Facilities on the E side of the outer basin:

(460) **Inland Steel Co., No. 4 Dock:** southernmost dock on E side of outer basin; 1,075 feet of berthing space along dolphins; 14 to 22 feet alongside; deck height, 3 to 5 feet; open storage for 240,000 tons of limestone; receipt of limestone; owned and operated by Inland Steel Co.

(461) **Inland Steel Co., No. 6 Dock:** immediately N of Inland Steel Co., No. 4 Dock; 3,370-foot face; 28 feet alongside; deck height, 6½ feet; open storage for over 2 million tons of material; cranes to 150 tons; receipt of

fluorspar, limestone, iron ore pellets, coke, and plant machinery; shipment of steel mill products and ammonium sulphate; owned and operated by Inland Steel Co.

Small-craft facility

(462) A marina on the lakeshore just S of the fill area that forms the E side of Indiana Harbor provides gasoline and a 5-ton hoist.

(463) Commonwealth Edison Co. of Indiana powerplant is on a bulkheaded fill area 4 miles NW of the entrance to Indiana Harbor.

(464) The **State boundary** between Indiana and Illinois is just W of the powerplant about 4 miles NW of Indiana Harbor entrance.

(465) **Calumet (South Chicago) Harbor** is 14 miles NW of Gary Harbor and about 333 miles by water from the Straits of Mackinac. The harbor is in the S part of the city of **Chicago, Ill.,** and comprises an outer harbor protected by breakwaters and the **Calumet River.** The city of Chicago, including Calumet and Chicago Harbors, is one of the largest inland ports in the world. Deep-draft traffic enters the harbors from Lake Michigan, and barge traffic enters from the Mississippi River via the Illinois Waterway. The principal commerce in the port includes receipt of iron ore, coal, and limestone.

Prominent features

(466) Stacks at the Commonwealth Edison Co. of Indiana powerplant 1.8 miles S of the mouth of Calumet River and at the U.S. Steel Corp. plant on the N side of the river mouth are prominent. A spire in Whiting, Ind., 3.9 miles S of the river mouth, is also prominent.

(467) **Calumet Harbor Light** (41°44.3'N., 87°30.5'W.), 51 feet above the water, is shown from a white cylindrical tower with an attached building on the N side of the breakwater gap 1.2 miles E of the Calumet River mouth.

(468) **Calumet Harbor Breakwater South End Light** (41°43'34"N., 87°29'36"W.), 50 feet above the water, is shown from a white square skeleton tower with red band, lower half open, on the SE end of the Calumet Harbor breakwater, a fog signal is at the light. This light is sometimes difficult to distinguish from vehicle lights on shore.

Channels

(469) A breakwater and breakwater extension extend E from the shore about 0.5 mile N of the mouth of Calumet River and turn SE to protect the river entrance and provide an outer harbor of refuge 1 square mile in extent. The outer end of the breakwater and each end of the extension are marked by lights. A dredged approach channel from Lake Michigan leads SW around the S end of the breakwater extension to the outer harbor basin, thence a dredged channel continues through the basin to the mouth of the Calumet River. The approach channel is marked by lighted buoys and the SW limit of the outer harbor basin is marked by buoys. A Federal project provides for a depth of 29 feet in the approach channel and 28 feet in the channel through the outer harbor basin. (See Notice to Mariners and latest editions of charts for controlling depths.)

(470) **North Slip** opens into the outer harbor 0.5 mile N of the mouth of Calumet River. Overhead power cables with a clearance of 109 feet cross the mouth of the slip. **South Slip** is entered 0.4 mile above the river mouth. A system of submerged bubbler pipes crosses the mouth of each slip; vessels are cautioned not to drop or drag anchor in the vicinity.

(471) The undredged portion of the outer harbor between the river mouth and the entrance to North Slip has depths of about 2 to 20 feet extending about 0.25 mile from shore. In April 1985, a rock, covered 1 foot, was reported about 470 feet ENE of Calumet Pierhead Light in about 41°44'04"N., 87°31'40"W.

(472) A diked disposal area is on the W side of the outer harbor S of the entrance to Calumet River. The NE corner of the area is marked by a light.

(473) A dredged channel leads from the W end of the outer harbor basin, between piers at the mouth of the Calumet River and upstream to Turning Basin No. 5, 6.06 miles above the mouth. Turning Basin Nos. 1 and 3 are on the E side of the channel 0.9 and 4.63 miles above the mouth of the river, respectively. The outer ends of the piers are marked by lights. A Federal project provides for a depth of 27 feet in the dredged channel from the mouth of the river to Turning Basin No. 5. (See Notice to Mariners and latest editions of charts for controlling depths.) In October 2001, the controlling depths were 24 feet in Turning Basin No. 1, 26 in Turning Basin No. 3, and 25 feet in Turning Basin No. 5. Several large pieces of concrete have fallen into water along the S edge of Turning Basin No. 3 and pose a potential danger to navigation.

(474) From Turning Basin No. 5, the Calumet River leads S for 0.7 mile to the Thomas J. O'Brien Lock at the entrance to the Illinois Waterway. About 0.5 mile above the lock, the Calumet River branches into the Little Calumet River and the Grand Calumet River. (The lock and the Little Calumet River are described under Illinois Waterway, this chapter.)

(475) **Grand Calumet River** formerly emptied into Lake Michigan at Gary, Ind., but its mouth is now closed, and it is a dead river 18 miles long with a very small drainage area. There is no current in the river except what is caused by floods and freshets. Except for

several shoals, the river is navigable by shallow-draft launches that can pass under the bridges.

(476) The limiting clearances under the bridges are 8 feet for about 3.5 miles, thence 5 feet for about 11 miles. The swing and bascule bridges across the river are inoperable. Several bridges have been replaced by earthfill causeways with only culverts to carry the flow. About 6 miles above the junction with Calumet River, a non-navigable branch connects with Calumet River Branch of Indiana Harbor Canal.

(477) **Lake Calumet,** NW of Turning Basin No. 5, is about 1.2 miles long N and S and about 1 mile wide. The lake is at practically the same level as Lake Michigan and has an average depth of about 2 feet. A temporary earth dike has been constructed at the S end of Lake Calumet by the Illinois International Port.

(478) A dredged channel leads NW from Turning Basin No. 5 in Calumet River to Lake Calumet. A Federal project provides for a depth of 27 feet in the dredged channel. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages

(479) The outer harbor basin provides good anchorage in mud and sand bottom. Due to the large number of vessels using this important shelter during severe weather, it is important that anchorage space within the harbor be utilized in an orderly manner. Accordingly, it is requested that vessels do not anchor closer than 1,000 feet to any part of the breakwaters unless no other anchorage space is available, and that, if it is necessary to anchor closer than 1,000 feet to the breakwaters, vessels anchor in such manner as not to unreasonably obstruct the free passage and progress of other vessels through the harbor.

(480) In good weather, vessels may also find anchorage within 3 miles E to S of Breakwater South End Light. However, charted wrecks and traffic lanes to Indiana and Calumet Harbors restrict the usable area somewhat.

Dangers

(481) Several shoals are in the approach to Calumet Harbor. A rocky bank with a least depth of 21 feet is 1 mile NE of Calumet Harbor Breakwater South End Light. A lighted buoy at the SE end of the ledge marks the N side of the dredged approach channel. Two 23-foot spots and a 27-foot spot, 2 to 2.5 miles NE of Calumet Harbor Light, are marked on the E side by a lighted buoy. **Calumet Bar**, an extensive area with depths of 22 to 24 feet, is on the NE side of the breakwater and extension.

(482) The gap between the breakwater and the extension provides an entrance to the harbor for small craft. However, small craft should exercise caution when using the entrance gap. Dangerous currents frequently exist in the entrance gap, especially during storms. Hazardous currents are also caused by surges resulting from a sudden rise or fall in the lake level. This frequently occurs during periods of calm. The Lake Carriers' Association recommends that cargo vessels use the S entrance exclusively.

(483) In general, the dredged areas of the outer harbor do not extend closer than 300 feet from the breakwaters. Mariners should exercise caution and not attempt to navigate in the undredged areas adjoining the breakwaters. Navigators are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

(484) In March 1984, a 150-foot break was reported in the breakwater extension about 150 yards NW of Calumet Harbor Breakwater South End Light; caution is advised.

Fluctuations of water level

(485) In addition to the normal fluctuations which affect Lake Michigan somewhat uniformly, local oscillations of up to 2 feet above or below Low Water Datum are reported to have durations of a few minutes to a few hours. These changes are produced by winds and barometric pressure changes which accompany storms. Strong sustained winds may also affect the water levels for as long as a day.

Caution

(486) Since the opening of Calumet Sag Channel, the Calumet River has a gentle flow away from Lake Michigan except at times of sudden fluctuations of water levels from heavy rains and/or flooding.

Towage

(487) Tugs to 1,640 and 1,250 hp are available in the Calumet (South Chicago) Harbor area from Great Lakes Towing Co. and North American Towing Co., respectively. Arrangements for the Great Lakes Towing Co. tugs are made through the dispatcher in Cleveland (800-321-3663) or via VHF-FM remote antenna. At least 3 hours advance notice is requested. The North American Towing Co. dispatcher is in Chicago (312-734-6311) and has VHF-FM capability to a 25-mile radius.

(488) Chicago is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(489) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

Structures across Calumet River and Little Calumet River
**Miles above North Pierhead Light*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Calumet River							
1	Overhead cable	Power	0.58				146	
2	Elgin, Joliet & Eastern Ry. bridge	Railroad	0.62			200	7	Vertical lift. Clearance up. 125 feet. Note 1.
3	92nd St. bridge	Highway	0.76			180	18	Bascule. Note 1.
	Turning Basin No. 1		0.94					
4	95th St. bridge	Highway	1.09			193	23	Bascule. Note 1.
5	Overhead cable	Power	1.33				148	
6	Norfolk Southern RR bridge	Railroad	1.34			138	23	Vertical lift. Permanently open. Clearance up 120 feet. Note 3.
7	Norfolk Southern Bridge	Railroad	1.36			138	23	Vertical lift. Clearance up 120 feet. Notes 3 and 4.
8	Chicago Skyway bridge	Highway	1.50			200	125	Fixed.
9	Overhead cable	Power	1.70				155	
10	Overhead cable	Power	1.72				155	
11	100th St. bridge	Highway	1.78			189	17	Bascule. Note 1.
12	106th St. bridge	Highway	2.58			192	17	Bascule. Note 1.
13	Overhead cable	Power	3.81				145	
	Turning Basin No.3		4.63					
14	Overhead cable	Power	5.10				147	
15	Chicago & Western Indiana RR bridge	Railroad	5.24			200	22	Vertical lift. Clearance up 125 feet. Note 1.
16	Torrence Ave. bridge	Highway	5.26			200	22	Vertical lift. Clearance up 125 feet. Note 1.
17	Norfolk Southern RR bridge	Railroad	5.59			200	22	Vertical lift. Clearance up 125 feet. Notes 1 and 2.
	Turning Basin No. 5		6.06					
18	130th St. bridge	Highway	6.25			219	29	Fixed.
19	Overhead cable	Power	6.26				49	
20	Overhead cable		6.30				121	
21	Chicago, South Shore & South Bend RR bridge	Railroad	6.33			250	29	Fixed.
22	Overhead cable		6.34					Data not available.
	Thomas J. O'Brien Lock		6.84					
	Little Calumet River							
23	Norfolk Southern RR Bridge	Railroad	7.92			250	24	Fixed.
24	Overhead pipeline	Gas	7.93				25	
25	I–94 bridge	Highway	8.59			250	39	Fixed.
26	Overhead cables	Power	10.23				64	

Structures across Calumet River and Little Calumet River
*Miles above North Pierhead Light
**Clear width in feet proceeding upstream

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
27	Overhead cable	Power	10.51				88	
28	Chicago & Western Indiana RR bridge	Railroad	10.53			250	24	Fixed.
29	Indiana Ave. bridge	Highway	10.80			250	25	Fixed.
30	Canadian National RR bridge	Railroad	10.97	71	300	300	25	Fixed.
31	Canadian National RR bridge	Railroad	10.99	71	300	300	34	Fixed.
32	Overhead cables	Power	11.02				38	
33	Overhead cable	Power	11.07				63	
34	Norfolk Southern RR bridge	Railroad	12.49			250	24	Fixed.
35	Overhead cable	Power	12.50				67	
36	Overhead cable	Power	12.99				48	
37	South Halsted St. bridge	Highway	13.00			226	26	Fixed.
	Junction with Calumet Sag Channel		13.48					
38	Ashland Ave bridge	Highway	14.07	50	50		26	Fixed.
39	Dan Ryan Expressway (I-57) bridge	Highway	14.12			145	42	Fixed.
40	Riverdale Rd. (Blue Island) bridge	Highway	14.47			52		Fixed. Site of old stone dam.

Note 1.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 2.–Bridge is kept in the open position except for the passage of a train.

Note 3.–See **33 CFR 117.1 through 117.59 and 117.389**, chapter 2, for drawbridge regulations.

Note 4.–Vessel operators should signal the bridge for openings on VHF-FM channel 16 (156.8 MHz) and provide vessel type/size (freighter/700 feet, tug without barge, tug with 2 barges/200 feet overall). Vessel operators should update ETA's as necessary.

INBOUND

1. Contact Norfolk Southern bridgetender when vessel is 15 minutes from Calumet Harbor Breakwater South End Light with ETA at railroad bridge.

2. Contact Norfolk Southern bridgetender when vessel is passing South End Light with ETA at railroad bridge.

3. Contact Norfolk Southern bridgetender when vessel is passing Calumet River Entrance Light at mouth of river with ETA at railroad bridge.

OUTBOUND

1. Contact Norfolk Southern bridgetender at least 15 minutes prior to departing dockside facilities and provide ETA at railroad bridge.

2. Contact Norfolk bridgetender when underway and confirm/update ETA at railroad bridge.

(490) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Coast Guard Station

(491) **Calumet Harbor Coast Guard Station** is on the lakefront in the S part of Calumet Park, about 1.1 miles S of Calumet River entrance.

Harbor regulations

(492) Local harbor regulations for Calumet Harbor have been established by the Illinois International Port and are enforced by various local law enforcement agencies, who can be reached through the Port. Copies of the regulations can be obtained from the Illinois International Port, 12800 South Butler Drive, Lake Calumet Harbor, Chicago, Ill. 60633. A **speed limit** of 5 mph (4.3 knots) is enforced within the harbor.

Wharves

(493) Calumet Harbor has numerous facilities in the outer harbor, the Calumet River and in Lake Calumet. Only the deep-draft facilities are described. (For complete information on the port facilities, refer to Port Series No. 46, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Most of the facilities described have highway and rail connections, and many have water and electrical shore-power connections. Many of the piers, wharves, and docks are used for mooring vessels during the closed navigation season.

Facilities in North Slip:

(494) **USX Corp., South Works, North Dock:** N side of the slip; 2,432-foot face; 26 to 29 feet alongside; deck height, 10 feet; shipment of slag; owned by USX Corp. and operated by USX Corp. and International Mill Services, Inc.

Facilities in South Slip, about 0.5 mile above the river mouth:

(495) **USX Corp., South Works, South Slip:** E side of the slip; 1,223-foot face; 18 to 30 feet alongside; deck height, 9 feet; 9 acres open storage; 30 ton gantry crane; shipment of billets, slabs, ingots and steel products; occasional receipt of machinery, equipment, and supplies; owned and operated by USX Corp.

Facilities along left descending bank of Calumet River:

(496) **Rail to Water Transfer Corp., Loading Dock:** immediately above E 100th Street bridge; 1,462 feet of berthing space; 27 to 31 feet alongside; deck height, 7 feet; 9 acres open storage; two loading towers, over 3,000 tons per hour each; shipment of coal, and bentonite clay; owned by Rail to Water Transfer Corp. and The Belt Railway Co. of Chicago; and operated by Rail to Water Transfer Corp.

(497) **Rail to Water Transfer Corp., Barge Unloading Slip:** inner part of N side of Slip No. 2, 2 miles above river mouth; 1,565-foot face; 17 to 21 feet alongside; deck height, 7 feet; 10 acres open storage; two crawler cranes; eight 9- to 22-cubic yard front-end loaders; receipt of coal and coke; owned and operated by Rail to Water Transfer Corp.

(498) **Material Service Corp., Yard No. 20 Dock:** S side of Slip No. 3; 1,327-foot face; 15 to 20 feet alongside; deck height, 7 feet; 8 acres open storage; receipt and shipment of dry bulk commodities; owned by Material Service Corp.; operated by Material Service Corp. and Coke Contracting Co., Inc.

(499) **General Mills, Rialto Grain Elevator Dock:** inner part of the N side of Slip No. 4; 854 feet of berthing space; 20 feet alongside; deck height, 7 feet; 2¾-million-bushel grain elevator and annex; one marine leg, unloading rate 20,000 bushels per hour; one vessel-loading spout, rate 20,000 bushels per hour; receipt and shipment of grain; owned and operated by General Mills, Inc.

(500) **Beemsterboer Slag and Ballast Wharf:** outer part of the S side of Slip No. 4; 1,020-foot face; 21 feet alongside; deck height, 7 feet; 30 acres of open storage; receipt of coal, shipment of coke; owned by George J. Beemsterboer, Inc. and operated by Beemsterboer Slag and Ballast Corp.

(501) **Continental Grain Co., Elevator B Dock:** W side of the river 1 mile above Slip No. 4, 1,050-foot face; 27 feet alongside; deck height, 8 feet; 7½-million-bushel grain elevator; two marine legs, combined unloading rate 20,000 bushels per hour; five vessel-loading spouts, average combined rate 40,000 bushels per hour; receipt and shipment of grain; owned and operated by Continental Grain Co.

(502) **Cargill Chicago Grain Dock:** W side of the river opposite Turning Basin No. 3; 1,145-foot face with additional 695 feet of berthing space immediately downstream; 25 to 29 feet alongside; deck height, 9 feet; 20-million-bushel grain elevator; one marine leg, unloading rate 11,000 bushels per hour; five vessel-loading spouts, combined rate 50,000 bushels per hour; receipt and shipment of grain; owned and operated by Cargill, Inc.

(503) **Cargill Vegetable Oil and Salt Dock:** immediately above Cargill Chicago Grain Dock; 690 feet of berthing space with dolphins; 14 to 27 feet alongside; deck height, 9 feet; open storage for 50,000 tons of salt;

tank storage for over 18 million gallons of molasses and over 1½ million gallons of soybean oil; receipt of molasses and salt, shipment of soybean oil; owned and operated by Cargill, Inc.

Facilities on the right descending bank of the Calumet River:

(504) **Ceres Terminals, Iroquois Landing Wharf:** S side of the river mouth; 2,825 feet of berthing space; 25 to 27 feet alongside; deck height, 9 feet; 210,000 square feet covered storage; 80 acres open storage; cranes to 200 tons; receipt and shipment of general and containerized cargo, steel products, structural steel, and vehicles; owned by Illinois International Port and operated by Ceres Terminals.

(505) **Federal Marine Terminals, North Dock:** S side of Turning Basin No. 1 and along river immediately downstream; 671-foot face in basin, 23 to 27 feet alongside; deck height, 9 feet; 426 feet of berthing space along river, 17 to 25 feet alongside, deck height, 7 feet; about 66,000 square feet covered storage; 12 acres open storage; cranes to 200 tons; receipt and shipment of general and containerized cargo, finished steel products, vehicles, and dry bulk commodities; owned and operated by Federal Marine Terminals, Inc.

(506) **Marblehead Lime Co. North Dock:** 0.3 mile below E 106th Street bridge; 929 feet of berthing space; 18 to 28 feet alongside; deck height, 9 feet; 5 acres open storage; receipt of limestone; owned and operated by Marblehead Lime Co.

(507) **Marblehead Lime Co. South Dock:** immediately below E 106th Street bridge; 1,030-foot face; 23 to 27 feet alongside; deck height, 7 feet; 5½ acres open storage; receipt of limestone; owned and operated by Marblehead Lime Co.

(508) **Interlake Furnace Plant, North Dock:** about 0.5 mile above E 106th Street bridge; 1,146 feet of berthing space; 22 to 29 feet alongside; deck height, 10 feet; open storage for 325,000 tons of iron ore; two unloading cranes, combined rate 600 tons per hour; receipt of iron ore pellets; owned and operated by Interlake, Inc.

(509) **Interlake Furnace Plant, South Dock:** immediately above Interlake Furnace Plant, North Dock; 1,187-foot face; 22 to 29 feet alongside; deck height, 7 and 9 feet; open storage for 900,000 tons of material; two unloading cranes, combined rate 1,850 tons per hour; receipt of iron ore, iron ore pellets, and limestone; shipment of pig iron; owned and operated by Interlake, Inc.

(510) **LTV Steel Co., Ore Dock:** immediately above Interlake Furnace Plant, South Dock; 2,288-foot face; 25 to 29 feet alongside; deck height, 11 feet; 13 acres open storage; two hulett-type ore unloaders, combined rate 2,200 tons per hour; receipt of iron ore, limestone, coking coal, ferrous scrap, and pig iron; shipment of steel products; owned and operated by LTV Steel Co.

(511) **Marathon Pipe Line Co., Calumet River Terminal Wharf:** SE side of the river .03 mile below Turning Basin No. 5; 750-foot face; 16 to 28 feet alongside; deck height, 8 feet; pipelines extend to tank storage for over 1 million barrels; occasional shipment of petroleum products; owned and operated by Marathon Pipe Line Co.

(512) **C-I-L Chemicals Wharf:** E side of Turning Basin No. 5; 150 feet of berthing space; 22 feet alongside; deck height, 8 feet; receipt and shipment of sulfuric acid; owned and operated by C-I-L Chemicals, Inc.

(513) **Scrap Corp. of America, Butler Dock:** SW side of Turning Basin No. 5; 740-foot face; 27 feet alongside; deck height, 6 to 7 feet; shipment and occasional receipt of scrap metal; owned and operated by Scrap Corp of America.

Facilities in Lake Calumet and its entrance channel:

(514) **Scrap Corp. of America, Pennsylvania Dock:** S side of entrance channel immediately above Turning Basin No. 5; 930-foot face; 27 feet alongside; deck height, 6 to 7 feet; 10 acres open storage; receipt and occasional shipment of scrap metal; owned and operated by Scrap Corp. of America.

(515) **Ceres Lake Calumet Harbor South Terminal, Shed No. 3 Wharf:** S side of entrance channel immediately above Pennsylvania Dock; 1,034 feet of berthing space; 27 feet alongside; deck height, 8 feet; 72,000 square feet covered storage; 10 acres open storage; cranes to 150 tons; receipt and shipment of general and containerized cargo, automobiles, scrap metal, and other dry bulk commodities; owned by Illinois International Port and operated by Ceres Terminals, Inc.

(516) **Lake Calumet Harbor, Shed No. 2 Wharf:** immediately above Shed No. 3 Wharf; 660-foot face; 27 feet alongside; deck height, 8 feet; 72,000 square feet covered storage; cranes to 25 tons; moorage of pilot boat and company-owned tugboats, launching and retrieving pleasure craft; owned by Illinois International Port and operated by Lakeland Marina Storage, Inc. and North American Towing Co.

(517) **Ceres Lake Calumet Harbor South Terminal, Shed No. 1 Wharf:** immediately above Shed No. 2 Wharf; 1,777-foot face; 27 feet alongside; deck height, 8 feet; 173,000 square feet covered storage; cranes to 150 tons; receipt and shipment of conventional and containerized general cargo, various bulk commodities and steel products; owned by Illinois International Port and operated by Ceres Terminals, Inc.

(518) **Indiana Grain Division, Gateway Elevator Dock:** S side of Lake Calumet Slip No. 1; 1,000-foot face; 27 feet alongside; deck height, 6 feet; 7¾-million-bushel grain

elevator; two marine legs, combined unloading rate 20,000 to 24,000 bushels per hour; eight vessel-loading spouts, combined rate 70,000 bushels per hour; receipt and shipment of grain; owned by Illinois International Port and operated by Indiana Grain Division of Indiana Farm Bureau Cooperative.

(519) **Continental Grain Co., Elevator C Wharf:** N side of Lake Calumet Slip No. 1; 1,020-foot face; 27 feet alongside; deck height, 6 feet; 6¾-million-bushel grain elevator; two marine legs, combined unloading rate 20,000 to 24,000 bushels per hour; eight vessel-loading spouts, combined rate 60,000 bushels per hour; receipt and shipment of grain; owned by Illinois International Port and operated by Continental Grain Co.

(520) **Ceres Lake Calumet Harbor North Terminal Wharf:** N side of Lake Calumet entrance channel 0.25 mile above Turning Basin No. 5; 1,840 feet of berthing space with dolphins; 23 to 28 feet alongside; deck height, 6 feet; 110,600 square feet covered storage; 30 acres open storage; tank storage for 2,000 tons of lime; cranes to 65 tons; receipt and shipment of steel products; receipt of various bulk materials including ore and lime; owned by Illinois International Port and operated by Ceres Illinois, Inc.

(521) **Stolt Terminals, Docks A and B:** 0.25 mile above Ceres Lake Calumet Harbor North Terminal Wharf; southeasternmost Dock A, 545 feet of berthing space with dolphins, 27 to 28 feet alongside; Dock B, 675 feet of berthing space with dolphins, 23 to 26 feet alongside; deck height, 6 feet; tank storage for 610,000 barrels; receipt and shipment of petroleum products, chemicals, petrochemicals, animal fats, vegetable oils, and other bulk liquids; owned by Illinois International Port and operated by Stolt Terminals (Chicago), Inc.

(522) **EmEsCo Marine Terminal:** Lake Calumet Slip No. 2; S side, 1,300 feet of berthing space; N side, 1,425 feet of berthing space; 27 feet alongside; deck height, 8 feet; 30,000 square feet covered storage; 41 acres open storage; two 60-ton cranes can handle 120 tons in tandem; receipt and shipment of general cargo and dry bulk materials; owned by Illinois International Port and operated by EmEsCo.

(523) **Medusa Cement Co., Chicago Distribution Terminal Dock:** Lake Calumet Slip No. 3, north side; 620-foot permanently moored vessel used as bulk cement storage and transfer facility; 30 feet alongside; deck height, 10 to 25 feet; storage for 20,000 tons of bulk cement; conveyor system for transferring bulk cement to truck loading bins; owned and operated by Cement Transit Co., a subsidiary of Medusa Cement Co.

Supplies

(524) Complete marine supplies and services are available. Bunker C and diesel fuel are delivered by barge or tank truck. Water is available at many of the wharves.

Repairs

(525) A graving dock of the American Ship Building Co. is on the E side of the Calumet River just above the E 100th Street bridge. The drydock has a clear length inside at the top of 727 feet, with a width of 78 feet on the sill at the entrance and 87 feet at the top. The depth over the sill is 17 feet at Low Water Datum. The shipyard performs all types of above- and below-the-waterline repairs.

Small-craft facilities

(526) There are no facilities for small craft on the Calumet River below the Thomas J. O'Brien Lock.

Communications

(527) Calumet Harbor is served by several major rail lines, several interstate highways, and three airports for passenger and freight service.

Charts 14927, 14926

(528) From Calumet Harbor N for 11 miles to the mouth of the Chicago River, the shore is bordered by shoals, detached shoal spots, and submerged wrecks extending about 4 miles off. A wreck, covered 13 feet and marked by a buoy, is about 0.3 mile N of the Calumet Harbor breakwater gap. **Clark Point Shoal,** 1.2 miles N of Calumet Harbor breakwater and marked on the outer end by a buoy, has depths of 5 to 9 feet extending about 0.7 mile from shore. A wreck, covered 19 feet, is 1 mile NNE of Clark Point Shoal.

(529) Chicago South District Filtration Plant is on a bulkheaded fill area 1.5 miles NW of the Calumet Harbor breakwater. The plant is protected by a detached breakwater marked on either end by a private light. The area between the breakwater and the plant and the area within 150 feet of the plant's SE bulkhead is a **no mooring-restricted area.** A jetty and a submerged dike, covered 6 feet, extend 0.5 mile NW from the plant to enclose a bathing beach.

(530) **Jackson Park Harbor,** 2 miles NW of the water filtration plant, is a small-craft refuge comprising an outer harbor and an inner harbor. The entrance to the harbor is protected on the N side by a pier that extends 0.2 mile ENE and bends N for 0.2 mile. In May 1982, it was reported that the outer end of the pier had collapsed into the lake; caution is advised. The bend of the pier is marked by a light. The entrance to the harbor, marked on either side by a private light, has depths of about 3 feet. Outer Harbor (Outer Lagoon) has depths

of 6 to 10 feet with shoaling within 150 feet of shore. A narrow channel with depths of 6 feet leads to Inner Harbor (Inner Lagoon). A fixed highway bridge with a clearance of 11 feet crosses the channel. A footbridge of unknown clearance crosses the channel on the E side of the highway bridge. Inner Harbor has depths of about 7 feet. Transient berths, gasoline, water, ice, a launching ramp, and sewage pump-out facilities are available in the harbor.

(531) **Fifty-ninth (59th) Street Harbor,** about 0.6 mile N of Jackson Park Harbor, is entered between parallel piers. The outer ends of the piers are marked by private lights. In 1979, depths of 10 feet were reported in the entrance channel with 5 feet in the basin. A fixed highway bridge with a clearance of 10 feet crosses the entrance channel.

(532) **South Park Shoal,** with a least depth of 7 feet and marked on the E side by a buoy, is 1.7 miles ENE of the entrance to 59th Street Harbor. **Madison Park Shoal,** with a depth of 13 feet, is 1.2 miles NE of 59th Street Harbor. **Clemson Shoal,** a rock ledge covered 18 feet, is marked on the E side by a lighted bell buoy 0.6 mile NE of South Park Shoal. **Hyde Park Outer Shoal,** covered 8 feet and marked on the E side by a buoy, is 0.7 mile N of South Park Shoal and 0.4 mile NW of Clemson Shoal. **Morgan Shoal,** with an obstruction covered 1 foot, extends 0.7 mile offshore about 1.4 miles N of 59th Street Harbor. A seasonal lighted buoy marks the outer end of the shoal. **Hyde Park Inner Shoal,** covered 11 feet, is 0.4 mile E of the outer end of Morgan Shoal. **Oakland Shoal,** with a least depth of 7 feet, extends 0.5 mile from shore about 1 mile N of Morgan Shoal.

(533) **Burnham Park Harbor,** a small-craft basin 2 miles S of the mouth of Chicago River, is enclosed on the E by Northerly Island. **Northerly Island** is an artificial island, attached at the N end to the mainland by a causeway which closes the N end of Burnham Park Harbor. The entrance to the harbor, from S, is marked by a private light on shore SW of the S end of Northerly Island and has a depth of about 16 feet. The harbor has central depths of about 15 feet with shoaling to less than 6 feet toward the E shore and depths of 7 to 10 feet along the piers on the W side of the harbor. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, a launching ramp are available in the harbor.

(534) A **danger zone** marked by private buoys extends from the S end of the airfield on Northerly Island S across the entrance to Burnham Park Harbor. (See **33 CFR 334.840,** chapter 2, for limits and regulations.)

(535) A bathing beach protected by a submerged dike, covered 1 foot, is on the E side of the N end of Northerly Island. Vessels should not attempt to enter the bathing beach area.

(536) From Northerly Island N to the entrance to Chicago River, numerous scattered shoal spots with depths of 10 to 24 feet are within about 2.5 miles of shore.

(537) **A safety and security zone** has been established over all waters and shoreline areas within 1000 yards of the shoreline surrounding Merrill C. Meigis Airfield. (See **165.1 through 165.7, 165.20 through 165.33, and 165.904**, chapter 2, for limits and regulations.)

Charts 14905, 14927, 14928, 14926

(538) **Chicago Harbor**, on the SW shore of Lake Michigan 11 miles N of Calumet Harbor, serves the city of **Chicago, Ill.,** and along with Calumet Harbor, forms one of the largest inland ports in the world. The harbor comprises an outer harbor with outer and inner basins and an inner harbor formed by the **Chicago River** and its branches. While there is some deep-draft traffic in the harbor, barge traffic from the Mississippi River via the Illinois Waterway constitutes the major use of Chicago Harbor. The major commodities handled at the deep-draft facilities in the harbor are general cargo, newsprint, salt, and cement.

Prominent features

(539) The skyline of Chicago is prominent in general, and its three tallest buildings are conspicuous. The 1,454-foot Sears Tower, 1.3 miles SW of the river mouth, is reported to be the tallest building in the world. Its top is usually obscured by any fog or inclement weather. The white 1,136-foot Standard Oil building is 0.5 mile SW of the river mouth. The dark brown trapezoidal 1,107-foot John Hancock Center 0.9 mile NW of the river mouth has two prominent lighted towers on its roof.

(540) **Chicago Harbor Light** (41°53'22"N., 87°35'26"W.), 82 feet above the water, is shown from a white conical tower on the S end of the breakwater on the N side of the entrance channel; a seasonal fog signal is at the light.

Channels

(541) The harbor consists of an outer harbor of refuge protected by breakwaters on the NE and E sides and an inner basin at the natural mouth of the Chicago River. The inner basin is protected by breakwaters and bulkheads. The outer harbor is entered from Lake Michigan through a dredged entrance channel leading W between the NE and E breakwaters; the ends of the breakwaters are marked by lights. The outer harbor affords access to the municipal pier on the W side of the harbor

and to the entrance channel to the inner basin. A 400-foot-wide breakwater gap at the N end of the outer harbor is marked by lights. The end of the breakwater on the E side of the gap is partially submerged. Caution should be exercised when transiting the gap.

(542) The inner basin, on the S side of the mouth of Chicago River, is entered from the W side of the outer harbor through the **Chicago Lock.** The SE guide wall of the lock is marked at the outer end by a light. The inner basin and the river may only be entered through the lock. The dredged river entrance channel extends from the lock across the N side of the inner basin through the mouth of the river upstream to Rush Street.

(543) Depths in the inner basin and river entrance shoreward of the Chicago Lock are referred to normal pool level, which is 0.6 foot below Low Water Datum, the plane of reference used in the outer harbor and elsewhere on Lake Michigan.

(544) In January-February 1990, the controlling depths were 29 feet in the approach channel; thence 24 feet in the N part of the outer harbor in the approach to Navy Pier and 26 feet in the S part of the outer basin in the approach to Chicago Lock; thence, in 1981, 21 feet in the S half of the channel and 19 feet in the N half of the channel from the outer harbor to the lock; thence, in January-February 1990, 21 feet for midwidth of 100 feet from the lock through the mouth of the river upstream to Rush Street.

(545) Navigators are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

(546) **Ogden Slip,** at the N end of the inner basin, is N of and parallel to the mouth of the Chicago River. The slip extends about 0.4 mile into the shoreline, and in 1977, had a centerline controlling depth of 16 feet except for shoaling at the W end.

(547) From its mouth, the Chicago River leads W for 1.3 miles to the junction of North Branch and South Branch. From the junction, **North Branch** leads NNW for 1 mile to the junction with **North Branch Canal,** thence these two channels continue NNW, separated by Goose Island, and rejoin at a turning basin at North Avenue. South Branch extends 4 miles S and SW to the junction with **South Fork** and continues SW for 0.8 mile to the Chicago Sanitary and Ship Canal. South Fork extends 1.3 miles S from South Branch.

(548) A Federal project provides for dredged channels in the Chicago River from its mouth to the junction with the North and South Branches, thence in North

Branch and North Branch Canal to the turning basin at North Avenue.

(549) In August-September 1990, the midchannel controlling depth was 19 feet in the Chicago River from Rush Street to the junction with the North Branch; thence the midchannel controlling depths were 15 feet to the junction with North Branch and North Branch Canal; thence the midchannel controlling depth in North Branch was 12 feet to the turning basin with depths of 9 to 12 feet in the SE part of the basin and 5 to 8 feet in the NW part of the basin except for shoaling to less than 3½ feet along the W edge, and 4 feet along the SE edge. The midchannel controlling depth in the North Branch Canal was 9 feet to the Ogden Avenue bridge, thence decreasing from 9 to 4 feet to the turning basin.

(550) The city of Chicago has improved the channel in North Branch N of the turning basin at North Avenue bridge. In 1977, the centerline controlling depth was 6 feet from the turning basin upstream to Addison Street bridge. In 1957, the channel from Addison Street bridge to Foster Avenue, just inside the S end of North Shore Channel, was dredged to a depth of 8 feet.

(551) The city of Chicago has also improved the channel in South Branch to the South Damen Avenue bridge, including turning basins at the junction with South Fork and on the W side of the South Damen Avenue bridge. In 1977, the centerline controlling depths were 20 feet at midchannel to the Baltimore and Ohio Chicago Terminal Railroad bridge at mile 3.64, thence 15 feet to the turning basin at the junction with South Fork, thence 3 to 14 feet in the basin with the best water on the E side, thence 19 feet on the centerline to the South Damen Avenue bridge with 8 to 23 feet in the basin on the W side of the bridge. Obstructions not disclosed by the soundings may exist in these channels.

(552) South Fork is badly fouled with oily waste. In June 1980, the reported controlling depth was 6 feet to the 35th Street bridge. Obstructions not disclosed by the soundings may exist.

(553) **North Shore Channel** joins North Branch about 5.5 miles above the turning basin at North Avenue and extends about 8 miles N to the harbor at Wilmette, Ill. The controlling depth in the channel is about 7 feet. A lock which blocks the channel at Wilmette is inoperable and is closed to all navigation.

(554) **Measured course**.–A 121°-301° measured course, 5,307 feet long, is on the lakeward side of the breakwater on the NE side of the outer harbor. The markers are one vertical white stripe between two vertical red stripes, painted on the breakwater.

Lock

(555) The Chicago Lock, operated by the U.S. Army Corps of Engineers, at the mouth of the Chicago River was constructed to prevent the flow of the river into the lake. The lock is 600 feet long and 80 feet wide with a depth of 23 feet over the sill. The zero of the water level gages set in the lock walls is at **Chicago City Datum**, which is 1.4 feet above Low Water Datum. A sound amplifier system is maintained by the lock operators for communication with vessel operators. (See **33 CFR 207.420,** chapter 2, for lock signals and regulations.) Vessels within the lock normally tie up to the S lock wall. However, under adverse weather conditions, such as strong S winds, vessels may wish to use the N lock wall.

(556) Ice may, at times, prevent full opening of the sector gates at the Chicago Lock. When the gates cannot be fully opened (due to ice build-up in the recessed areas), they are vulnerable to excessive damage from vessels entering or departing the lock chamber. When barges have ice build-up on their sides and considerable ice flows are present in the channel, the width of the tows may be restricted by the lockmaster to facilitate passage of the tow into the lock chamber and to minimize lock structural damage from ice.

(557) Due to the lock at the mouth of the Chicago River and other projects by the Chicago Sanitary District, the flow of the river has been reversed and is now away from the lake, except in North Branch.

Anchorages

(558) General and small-craft anchorages are in Chicago outer harbor and in the small-craft basin at the SW corner of the outer harbor. (See **33 CFR 110.1, 110.83, and 110.205,** chapter 2, for limits and regulations.)

Danger

(559) A rock-filled pile pier 3 to 6 feet high, marked at the outer end by a private light, extends 0.5 mile E from shore into the outer harbor, parallel to and 400 feet N of the Chicago River entrance lock.

Caution

(560) Submerged wrecks are along the W side of North Branch Canal about 0.4 and 0.8 mile above the junction with North Branch. The northernmost wreck is marked by a buoy.

(561) Four Mile Crib, marked by a private light with a fog signal, is 2.6 miles ESE of Chicago Harbor Light.

Bridges

(562) The city has instituted a system of roving bridgetenders to operate or to assist the resident tender

to operate certain bridges across the Chicago River, the North Branch, and the South Branch. The bridges affected are annotated in the tables of bridges, following. At least 30 minutes advance notice is required for the first bridge through which a vessel intends to pass. Thence, telephone advice of vessel movements will be passed from bridge to bridge. Notice may be given to the Bridge Desk of the Chicago Department of Public Works, telephone, 744–4200/4201.

(563) The city of Chicago is attempting to minimize noise in the area bounded by the Michigan Avenue bridge on the E, the Chicago Avenue bridge on the N, and the Roosevelt Road bridge on the S. Pilots of vessels should give the customary whistle signal for the first bridge approached within this area and, when in the draw of the bridge, should inform the bridgetender of their destination. The bridgetenders will then telephone ahead for the necessary bridge openings. Pilots are asked not to signal for other bridge openings in this area unless prompt service is not provided.

(564) **Submarine tunnels.–**Numerous submarine tunnels cross Chicago River and its branches.

Weather, Chicago and vicinity

(565) Chicago, IL, is located on the extreme southwestern shore of Lake Michigan and in the northeastern portion of the state. The location averages about 18 days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 84°F (28.9°C) and an average minimum of 63°F (17.2°C). January is the coolest month with an average high of 29°F (-2°C) and an average minimum of 14°F (-10°C). The highest temperature on record for Chicago is 104°F (40°C) recorded in June 1988 and July 1995 and the lowest temperature on record is -27°F (-32.8°C) recorded in January 1985. About 132 days each year experience temperatures below 32°F (0°C) and an average twenty days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 41°F (5°C) and every month except June, July, and August has recorded temperatures below freezing (0°C).

(566) The average annual precipitation for Chicago is 35.25 inches (895 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter months. Precipitation falls on about 190 days each year. The wettest month is August with 4.10 inches (104 mm) and the driest, February, averages only 1.37 inches (34.8 mm). An average of 37 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 68 days each year and averages about 38 inches (965 mm) each year. January averages about ten inches (254 mm) per year and December averages about eight inches (203 mm) each year. Ten-inch (254 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About seven days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June through September. Fog is present on average 131 days each year and is rather evenly distributed throughout the year with a slight maximum during the winter season.

(567) The prevailing wind direction in Chicago is the south-southwest. The average wind speed is nine knots. Winter through early spring is the windiest period and a maximum gust of 73 knots occurred in March 1991.

(568) (See Page 542 for **Chicago climatological table.**)

Towage

(569) Tugs for the Chicago area are available from Calumet (South Chicago) Harbor. (See Towage under Calumet (South Chicago) Harbor.)

(570) Chicago is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(571) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(572) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) A U.S. Public Health Service **outpatient clinic** is in Chicago. (See Appendix A for address.)

Wharves

(573) The principal use of Chicago Harbor is by barges which reach the port from the Mississippi River via the Illinois Waterway. There are about 100 facilities for barges in the harbor. Only the deep-draft facilities in the harbor are described here. (For complete information on the port facilities, refer to Port Series No. 46, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) All the facilities described have highway and rail connections, and some have water and electrical shore-power connections.

(574) **Morton Salt, Elston Avenue Wharf:** W side of North Branch, 0.25 mile below North Avenue turning basin; 532-foot face; 14 to 18 feet alongside; deck height, 8 to 12 feet; warehouse storage for 25,000 tons of salt; receipt of salt; owned and operated by Morton Salt Co.

(575) **Klemp Corp. Wharf:** E side of North Branch just below North Avenue turning basin; 397-foot face; 13 to 17 feet alongside; deck height, 8 feet; rental cranes

Structures across Chicago River and its Branches
**Miles above W end of Chicago Lock (41°53'18"N., 87°36'28"W.)*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Main River							
	Ogden Slip		0.22					
1	Lake Shore Drive bridge	Highway	0.32			210	25	Bascule. Note 1.
2	Lake Shore Drive bridge (over Ogden Slip)	Highway	0.42			70	20	Fixed.
3	Columbus Drive bridge	Highway	0.67			176	21	Bascule. Note 1.
4	Michigan Ave. Bridge	Highway	0.85			195	17	Bascule. Notes 1 and 2.
5	Wabash Ave. bridge	Highway	0.98			193	21	Bascule. Notes 1. and 3.
6	State St. bridge	Highway	1.05			200	21	Bascule. Note 1.
7	Dearborn St. bridge	Highway	1.13			200	22	Bascule. Note 1.
8	Clark St. bridge	Highway	1.21			200	19	Bascule. Notes 1 and 2.
9	La Salle St. bridge	Highway	1.29			200	17	Bascule. Notes 1 and 2.
10	Wells St. bridge	Highway & Railroad	1.37			200	17	Bascule. Note 1.
11	Franklin-Orleans St. bridge	Highway	1.47			210	17	Bascule. Notes 1 and 3.
	South Branch							
12	Lake St. bridge	Highway & Railroad	1.64			195	18	Bascule. Note 1.
13	Randolph St. bridge	Highway	1.73			160	21	Bascule. Note 1.
14	Washington St. bridge	Highway	1.81			160	17	Bascule. Notes 1 and 3.
15	Madison St. bridge	Highway	1.90			168	18	Bascule. Notes 1 and 3.
16	Monroe St. bridge	Highway	1.99			165	17	Bascule. Notes 1 and 3.
17	Adams St. bridge	Highway	2.08			151	17	Bascule. Notes 1 and 3.
18	Jackson Blvd. bridge	Highway	2.17			140	17	Bascule. Notes 1 and 3.
19	Van Buren St. bridge	Highway	2.26			170	17	Bascule. Notes 1 and 3.
20	Eisenhower Expressway bridge	Highway	2.35			169	17	Bascule. Notes 1.
21	Harrison St. bridge	Highway	2.44			170	17	Bascule. Notes 1 and 3.
22	Polk St. bridge	Highway	2.61			130		Bridge leaves removed. Abutments remain.
23	Roosevelt Rd. bridge	Highway	2.94			170	17	Bascule. Notes 1 and 3.
24	Baltimore & Ohio Chicago Terminal RR bridge	Railroad	3.36			170	19	Bascule. Notes 1 and 3.
25	Norfolk Southern RR bridge	Railroad	3.37			170	20	Bascule. Notes 1 and 3.
26	18th St. bridge	Highway	3.60			125	22	Bascule. Notes 1 and 3.
27	Amtrak bridge	Railroad	3.77			156	10	Vertical lift. Clearance up 120 feet. Notes 1 and 7.
28	Canal St. bridge	Highway	3.88			167	17	Bascule. Notes 1 and 3.
29	Cermak Rd. bridge	Highway	4.05			140	17	Bascule. Notes 1.
30	Dan Ryan Expressway bridge	Highway	4.36			170	63	Fixed.

Structures across Chicago River and its Branches
**Miles above W end of Chicago Lock (41°53'18"N., 87°36'28"W.)*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
31	South Halsted St. bridge	Highway	4.47			163	24	Bascule. Notes 1 and 3.
32	South Throop St. bridge	Highway	5.08			131		Bridge removed. Abutments remain.
33	South Loomis St. bridge	Highway	5.29			144	22	Bascule. Notes 1, 3, and 5.
	Junction with South Fork		5.49					
34	South Ashland Ave. bridge	Highway	5.57			183	21	Bascule. Notes 1 and 3.
35	South Damen Ave. bridge	Highway	6.14			140	28	Fixed.
	Chicago Sanitary and Ship Canal		6.28					
	South Fork of South Branch							
36	Canadian National RR bridge	Railroad	5.78			100	17	Fixed.
37	Adlai E. Stevenson Expressway bridge	Highway	5.83			90	31	Fixed.
38	Archer Ave. bridge	Highway	5.86			90	17	Fixed.
39	35th St. bridge	Highway	6.53			121	12	Fixed.
	North Branch							
40	Chicago & North Western RR bridge	Railroad	1.76			100	6	Bascule. Notes 1 and 6.
41	Kinzie St. bridge	Highway	1.81			105	16	Bascule. Note 1.
42	Grand Ave. bridge	Highway	2.00			134	17	Bascule. Notes 1 and 3.
43	Ohio St. bridge	Highway	2.09			138	31	Bascule. Note 1.
44	Erie St. bridge	Highway	2.21			131		Bridge leaves removed. Abutments remain.
45	Chicago Ave. bridge	Highway	2.40			145	17	Bascule. Notes 1 and 2.
	Lower junction with North Branch Canal		2.52					
46	North Halsted St. bridge	Highway	2.65			140	17	Bascule. Note 1
47	Division St. bridge	Highway	3.30			100	17	Bascule. Notes 3 and 4.
	Turning Basin		3.73					
48	North Ave. bridge	Highway	3.81			137	16	Fixed.
49	Canadian Pacific Railway bridge	Railroad	4.43			81	10	Swing. Notes 1 and 3.
50	Cortland St. bridge	Highway	4.48			101	17	Bascule. Note 4.
51	Overhead cable	Power	4.83				36	
52	Webster Ave. bridge	Highway	4.85			128	17	Bascule. Note 4.
53	North Ashland Ave. bridge	Highway	4.90			140	17	Bascule. Note 4.
54	Union Pacific RR bridge	Railroad	5.01			123	19	Bascule. Note 4.
55	Fullerton Ave. bridge	Highway	5.30			92	22	Fixed.
56	North Damen Ave. bridge	Highway	5.59			118	24	Fixed.
57	Diversey Parkway bridge	Highway	5.99			52	17	Fixed.

Structures across Chicago River and its Branches
**Miles above W end of Chicago Lock (41°53'18"N., 87°36'28"W.)*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
58	Western Ave. bridge	Highway	6.39			95	18	Fixed.
59	Belmont Ave. bridge	Highway	6.76			75	18	Bascule.
60	Overhead cable	Power	6.80				40	
61	Overhead cable	Power	7.24				48	
62	Addison St. bridge	Highway	7.30			73	18	Fixed.
63	Overhead cable		7.41					Data not available.
64	Irving Park Rd. bridge	Highway	7.83			62	18	Fixed.
65	Montrose Ave. bridge	Highway	8.33			68	17	Fixed.
66	Wilson Ave. bridge	Highway	8.60			73	17	Fixed.
67	Overhead cable		8.72					Data not available.
68	Chicago Transit Authority bridge (Ravenswood)	Railroad	8.73			40	19	Fixed.
69	Lawrence Ave. bridge	Highway	8.94			54	18	Fixed.
70	Argyle St. bridge	Highway	9.23			59	18	Fixed.
71	Overhead pipeline	Water	9.24				18	
	North Shore Channel		9.36					
	North Branch Canal							
72	Overhead cable	Power	2.80				72	
73	Overhead cable	Power	2.81				72	
74	North Halsted St. bridge	Highway	2.85			56	15	Bascule. Note 4.
75	Division St. bridge	Highway	2.99			74	17	Bascule. Notes 3 and 4.
76	Overhead pipeline		3.13			137	30	
77	Overhead cable	Power	3.41				76	
78	Canadian Pacific RR bridge	Railroad	3.54			113	8	Swing. Note 5.

Note 1.–See **33 CFR 117.1 through 117.59 and 117.391**, chapter 2, for drawbridge regulations.

Note 2.–Resident bridgetender assisted by roving tender. Advance notice is required for opening.

Note 3.–Operated by roving bridgetender. Advance notice is required for opening.

Note 4.–See **33 CFR 117.391 (c)**, chapter 2, for drawbridge regulations.

Note 5.–Vertical clearance is for center width of 93 feet.

Note 6.–Bridge kept in open position except for passage of a train.

Note 7.–The bridgetender can be contacted on VHF-FM channel 16, call “South Branch” or WHU-713; or by telephone, 312-930-4125.

available; occasional receipt of steel sheets and structural shapes; owned and operated by Klemp Corp.

(576) **Dundee Cement Co., Chicago Wharf:** E side of North Branch 650 feet above Ogden Avenue bridge; 217-foot face; 15 to 18 feet alongside; deck height, 7 feet; silo storage for 25,000 tons of cement; receipt of bulk cement; owned and operated by Dundee Cement Co.

(577) **International Salt Co. Dock:** E side of North Branch below Ogden Avenue bridge; 518-foot face; 16 to 21 feet alongside; deck height, 10 feet; covered storage for 8,000 tons of salt; open storage for 7,000 tons of salt; receipt of salt; owned and operated by International Salt Co.

(578) The **Jardine Water Filtration Plant** is on a bulkheaded fill area just N of Navy Pier. The outer ends of the bulkheads are marked by private lights. A **security zone** has been established in the waters between the Navy Pier and the water filtration plant. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.) An area of fish nets, marked by private lighted buoys and floodlighted, adjoins the N bulkhead of the filtration plant.

Supplies

(579) All types of marine supplies and provisions are available at Calumet Harbor. Tank vessels provide bunker fuel to vessels at their berths.

Repairs

(580) The nearest facility for repairs to deep-draft vessels is in Calumet Harbor. Lemont Shipbuilding and Repair Co. has a 2,500-ton vertical lift and makes above- and below-the-waterline repairs to towboats at its facility on the Chicago Sanitary and Ship Canal about 4 miles W of the junction with Calumet Sag Channel. Henry C. Grebe and Co. has a 75-ton marine railway for vessels to 80 feet long on the W side of North Branch about 3 miles above North Avenue turning basin. Above- and below-the-waterline hull repairs and engine repairs are made.

Small-craft facilities

(581) A small-craft basin, protected by breakwaters, is entered from eastward through an opening in the breakwaters about 0.9 mile S of the natural entrance of the Chicago River. The entrance to the basin is marked by lights. Gasoline, diesel fuel, water, ice and launching ramps are available. Several other small-craft basins along the Chicago lakefront are described under separate headings.

Communications

(582) Chicago has excellent rail, highway, and air connections for passengers and freight.

Illinois Waterway

(583) This waterway is a system of channels connecting Lake Michigan with the **Mississippi River** at Grafton, Ill. From the mouth of the Chicago River to the Mississippi River, the waterway is 327 miles long. The **Illinois River,** from its headwaters at the confluence of the **Des Plaines River** and **Kankakee River** to its mouth at the junction with the Mississippi River, constitutes about 273 miles of the waterway. The waterway may be entered through Chicago Harbor via the Chicago River and the Chicago River South Branch, or through Calumet Harbor via the Calumet River, the **Little Calumet River,** and the **Calumet Sag Channel.** These channels connect with the **Chicago Sanitary and Ship Canal** which leads SW to connect with the Des Plaines River at Lockport. The waterway follows the Des Plaines River to the head of the Illinois River and thence down the Illinois River to the junction with the Mississippi River at Grafton. The Mississippi River below Grafton is discussed in U.S. Coast Pilot 5.

(584) **Water Diversion from Lake Michigan.**–The State of Illinois is authorized by a United States Supreme Court decree to divert 3,200 cubic feet per second of water from Lake Michigan into the channels of the Illinois Waterway. As a result, the flow of water is normally away from the lake, except during excessive storm runoff or when lake levels are more than 2 feet below Low Water Datum.

(585) In addition to entering the waterway through the Chicago and Calumet Rivers, water from Lake Michigan also enters the waterway through the North Shore Channel at Wilmette Harbor. North Shore Channel then connects with the North Branch of the Chicago River. Vessels, however, may not enter the waterway at Wilmette as the lock there is inoperable.

Channels

(586) The channels in the Illinois Waterway are maintained at the Federal project depth of 9 feet.

(587) The minimum horizontal clearance, normal to the channel, is 80 feet at the butterfly dam in the Chicago Sanitary and Ship Canal.

U.S. Army Corps of Engineers (USACE) Emergency Numbers

(588) The U.S. Army Corps of Engineers, Rock Island District, has emergency telephone numbers for reporting navigation channel groundings, closures, and

other situations of importance for both the Illinois Waterway and the Mississippi River: Illinois Waterway 319-328-2719; Mississippi River 319-328-2718.

Water levels

(589) Water levels in the Chicago Sanitary and Ship Canal are governed by the controlling works located at the mouth of the Chicago River, in the Calumet River, at Wilmette Harbor, and at Lockport.

Currents

(590) Currents in Calumet Sag Channel are 0.2 to 0.4 mph with a maximum of 1.3 mph during periods of heavy runoff.

Bridges

(591) Minimum vertical clearances are 18 feet in the Little Calumet River and 24 feet in Calumet Sag Channel. (For bridge clearances in the Chicago River and the Chicago River South Branch, see the Chicago River bridge tables.) From the South Branch of the Chicago River, the minimum vertical clearance in the Sanitary and Ship Canal is 17 feet to Lemont, thence from Lemont to the junction with the Des Plaines River the minimum clearance is 44 feet. Due to this great change in vertical clearances in the Sanitary and Ship Canal, lake-bound barges change tugs at Lemont for smaller tugs which can navigate under the bridges between Lemont and Lake Michigan. The minimum vertical clearance in the Des Plaines River and the Illinois River is 46 feet above normal pool level (34 feet above extreme High water). (See the bridge tables following.)

(592) **Overhead cables.**–Numerous overhead cables cross all these channels, but do not obstruct any craft which can pass under the bridges.

Locks

(593) The Illinois Waterway has nine U.S. Government locks including Chicago Lock at the mouth of the Chicago River. (See **33 CFR 207.300,** chapter 2, for lock regulations in the Illinois Waterway.)

(594) The **Thomas J. O'Brien Lock** is on the W side of the Calumet River about 0.7 mile above Turning Basin No. 5 in Calumet Harbor. A dam with controlling works extends from the lock wall E across the river and allows passage through the lock only. The lock is 1,000 feet long and 110 feet wide with a depth over the sills of 15 feet and a nominal lift of 2 feet. Passage through the lock is governed by flashing traffic signal lights on the W lock wall near the upper and lower lock gates. (See **33 CFR 207.300 and 207.425,** chapter 2, for lock regulations.) With favorable river conditions or when for any reason the lock is not being operated, the lock gates at both ends of the chamber will be fully opened. At such times, navigation through the lock remains under control of the lockmaster and the following regulations apply: for commercial craft, the **speed limit** through the chamber is 4 mph, passing in the lock chamber in either direction is prohibited, and stopping along or tying up to the lock or guide walls is prohibited; for recreational craft, speed through the chamber shall be commensurate with safety but not more than 4 mph, passing commercial craft in either direction is prohibited, and the lock is to be used for through navigation only.

(595) **Lockport Lock**, in the Chicago Sanitary and Ship Canal at the junction with the Des Plaines River, is 600 feet long and 110 feet wide with a nominal lift of 39.6 feet. An adjoining auxiliary lock is inoperable. Occasionally when heavy precipitation is predicted, the water level in the Sanitary and Ship Canal will be lowered to accommodate the expected water runoff in the canal. When the water in the canal falls below a level of 566.68 feet above mean water level at Father Point (Points au Pere), Que., International Great Lakes Datum (1955), or its equivalent, locking operations are suspended for lack of navigable depth over the upper lock sill. During periods of heavy discharge through the controlling works adjacent to the lock, currents in the channel below the lock may be strong enough to break mooring lines or stop the progress of low power vessels and large tows. Vessels moored in the vicinity or transiting the lock should monitor VHF-FM channel 16 for announcements of changes in discharge rates.

(596) The Lockport Controlling Works and a butterfly dam are about 2 miles N of Lockport Lock. The controlling works are on the W bank of the canal just N of the butterfly dam. The sluice gates of the controlling works are equipped with two oscillating red warning lights, one directed each way in the canal so as to be readily visible to mariners. The lights operate when the sluice gates are open and warn mariners to keep to the E side of the channel, clear of the sluice gates. The butterfly dam swings on pivots located in midstream. The dam is normally open and provides a horizontal clearance of 80 feet on either side. The dam is solely a safety device, providing a method of stopping the flow of water in the event of damage to the levee walls or to the Lockport Lock and powerplant complex downstream. Mariners are cautioned to watch out for this structure. Fluctuations in the water level of up to 10 feet may be expected immediately above the Lockport Lock, decreasing to 4 feet at the head of the canal.

(597) **Brandon Road Lock**, in the Des Plaines River about 4.8 miles below the Lockport Lock, is 600 feet long and 110 feet wide with a nominal lift of 34 feet. Immediately above the lock is a large basin well suited for turning and rearranging tows. The dam at Brandon Road has movable tainter and sluice gates which

Structures across Chicago Sanitary and Ship Canal

Miles above W end of Chicago Lock (41°53'18"N., 87°36'28"W.)

****Clear width in feet proceeding away from the lake***

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Low	High	
1	South Western Ave. bridge	Highway	6.7			155	22		Vertical lift. Note 1.
2	Baltimore & Ohio Chicago Terminal RR bridge	Railroad	6.9			120	17		Bascule. Note 1.
3	South California Ave. bridge	Highway	7.3			128	17		Bascule. Note 1.
4	Canadian National RR bridge	Railroad	7.7	85	50		19		Swing. Note 1.
5	South Kedzie Ave. bridge	Highway	7.8			130	22		Fixed.
6	Grand Trunk Western Ry. bridge	Railroad	8.4	45	80		18		Swing. Note 1.
7	South Pulaski Rd. bridge	Highway	8.9			140	31		Fixed.
8	Belt RR bridge	Railroad	9.7		97		17		Swing. Note 1.
9	South Cicero Ave. bridge	Highway	10.0			140	18		Bascule. Note 1.
10	South Central Ave. bridge	Highway	11.1			170	42		Fixed.
11	Atchison, Topeka & Sante Fe Ry. bridge	Railroad	12.5	130	85		18		Swing. Note 1.
12	South Harlem Ave. bridge	Highway	13.3			140	23		Bascule. Note 1.
13	Adlai E. Stevenson Expressway bridge	Highway	13.9			160	41		Twin fixed.
14	Lawndale Ave. bridge	Highway	14.3			160	39		Twin fixed.
15	Baltimore & Ohio Chicago Terminal RR bridge	Railroad	15.1		90	113	18		Swing. Note 1.
16	La Grange Road (Justice) bridge	Highway	17.9			260	40		Twin fixed.
17	Northern Illinois Toll Highway bridges	Highway	18.1			242	39		Twin fixed.
18	Willow Springs Rd. bridge	Highway	19.4			165	39		Bascule. Note 1.
19	Sag Highway bridge	Highway	23.2			160	39		Fixed.
	Calumet Sag Channel		23.8						
20	Overhead pipeline		24.0				55		
21	Burlington Northern Santa Fe RR bridge	Railroad	26.7			160	19		Swing. Note 1.
22	Lemont High-Rise Bridge	Highway	26.7			227	47		Fixed.
23	Overhead pipeline		30.7				44		
24	135th Street bridge	Highway	31.1			160	48		Fixed.
25	Overhead pipeline		31.9				46		
26	Butterfly dam		34.2	80	80				
27	9th St. bridge, Lockport	Highway	34.6			225	47		Fixed.
28	16th St. bridge, Lockport	Highway	35.2		160		4		Swing.
	Lockport Lock		36.2						
29	Lockport Lock bridge	Foot	36.2			110	51		Fixed.
	Junction with Des Plaines River		37.1						Note 2 .

Note 1.—See **33 CFR 117.391 (c),** chapter 2, for drawbridge regulations.

Note 2.–See the table of bridges across Des Plaines River.

*Bridges across North Shore Channel

Miles above W end of Chicago Lock (41°53'18"N., 87°36'28"W.)

****Clear width in feet proceeding toward Wilmette***

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Junction with North Branch Chicago River		9.36					
1	Foster Ave bridge	Highway	9.49			59	18	Fixed.
2	Bryn Mawr Ave. bridge	Highway	10.00			62	18	Fixed.
3	Peterson Ave. bridge	Highway	10.53			60	18	Fixed.
4	Lincoln Ave. bridge	Highway	10.62			60	19	Fixed.
5	Devon Ave. bridge	Highway	11.01			67	18	Fixed.
6	Touhy Ave. bridge	Highway	12.02			67	19	Fixed.
7	Howard St. bridge	Highway	12.52			81	19	Fixed.
8	Chicago Transit Authority bridge	Railroad	12.77			101	33	Fixed.
9	Union Pacific RR bridge	Railroad	12.92			60	19	Fixed.
10	Oakton St. bridge	Highway	13.03			81	19	Fixed.
11	Main St. bridge	Highway	13.53			67	19	Fixed.
12	Dempster St. bridge	Highway	14.03			67	19	Fixed.
13	Church St. bridge	Highway	14.54			67	19	Fixed.
14	Emerson St. bridge	Highway	14.83			67	20	Fixed.
15	Brown Ave. bridge	Highway	15.29			67	20	Fixed.
16	Green Bay Rd. bridge.	Highway	15.68			66	20	Fixed.
17	Union Pacific RR bridge	Railroad	15.69			59	26	Fixed.
18	Lincoln St. bridge	Highway	16.03			60	20	Fixed.
19	Central St. bridge	Highway	16.20			63	20	Fixed.
20	Chicago Transit Authority bridge	Railroad	16.31			45	35	Fixed.
21	Isabella St. bridge	Highway	16.52			67	20	Fixed.
22	Maple Ave. bridge	Highway	16.69			67	21	Fixed.
23	Linden Ave. bridge	Highway	16.86			61	20	Fixed.
24	Sheridan Rd. bridge	Highway	17.00			32	21	Fixed.
	Wilmette Lock		17.00					Inoperable. Closed to navigation.

Bridges across Des Plaines River

***Miles above end of Chicago Lock (41°53'18"N., 87°36'28"W.)**

****Clear width in feet proceeding away from Lake Michigan**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Pool level	High water	
	W end of Chicago Sanitary and Ship Canal		37.1						
1	Lockport-Elgin, Joliet & Eastern Ry. bridge	Railroad	37.2			225	24	20	Vertical lift. WHX-746. Notes 1 and 9.
2	Joliet-Ruby St. (SR 53) bridge	Highway	38.5	200			16	13	Bascule. WZQ-8761. Notes 2, 3, 5 and 9.
3	Joliet-Jackson St. bridge	Highway	38.8			150	16	13	Bascule. Notes 4 and 5.
4	Joliet-Cass St. (US 30) bridge	Highway	39.1			150	16	13	Bascule. Notes 4 and 5.
5	Joliet-Jefferson St. bridge	Highway	39.4			150	16	13	Bascule. Notes 4 and 5.
6	Joliet-Chicago Rock Island & Pacific RR bridge	Railroad	39.6			150	9	6	Vertical lift. KUF-907. Notes 6, 8, and 10.
7	Joliet-McDonough St. (US 6, US 52) bridge	Highway	39.8			150	16	14	Bascule. WZQ-8761. Notes 2, 4, 5, and 9.
8	I–80 bridges	Highway	40.3			300	46	43	Twin fixed.
	Brandon Road Lock and junction with Illinois and Michigan Canal		41.2						
9	Rockdale-Brandon Rd. bridge	Highway	41.4			110		8	Bascule. WZQ-8761.
10	Overhead conveyor		42.3			480		48	Suspension.
11	Channahon–I–55 bridges	Highway	49.3			420	47	41	Twin fixed.
	Junction with Kankakee River, Head of Illinois River		54.3						Note 7.

Note 1.–Bridge kept in the open position except for the passage of a train.

Note 2.–Bridge clearance gages have been installed at Joliet near the upstream end of the retaining wall above Ruby Street for the guidance of downbound vessels and on the left bridge pier downstream of McDonough Street for the guidance of upbound vessels. The gages are set to show the actual clearance between the water surface and the low steel of the bridges for the center 80-foot width of span. A sign over the gages reads, "Closed Vertical Clearance for Center 80 Feet of Span Joliet City Bridges." Masters of all vessels that can safely pass under the bridges in closed position are requested to do so and refrain from opening the bridges whenever possible.

Note 3.–Clear heights are for 105-foot width.

Note 4.–Clear heights are for 80-foot width.

Note 5.–See **33 CFR 117.1 through 117.59 and 117.395**, chapter 2, for drawbridge regulations.

Note 6.–Span raises 41.5 feet above heights shown. Several collisions have occurred at this bridge, and vessel masters are urged to reduce speed and exercise caution when passing the bridge.

Note 7.–For continuation, see the table of bridges across the Illinois River.

Note 8.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 9.–The bridgetender monitors VHF-FM channel 16 and works on channel 13.

Note 10.–The bridgetender monitors VHF-FM channel 16 and works on channel 14.

control the flow and make it possible to maintain a pool level, with small fluctuation above the dam, under normal conditions. Below the dam, an 8¾-foot fluctuation in water level may be expected.

(598) The remaining five locks are in the Illinois River at Dresden Island, Marseilles, Starved Rock, Peoria, and LaGrange. Each lock is 600 feet long and 110 feet wide.

(599) **Dresden Island Lock**, just below the confluence of the Des Plaines River and the Kankakee River, has a nominal lift of 21.75 feet. The pool above the lock is wide, while that below the lock is quite narrow for about 22 miles. High flows from rainfall runoff and spring thaws can cause the lower pool level to fluctuate drastically; fluctuations of 22 feet may be expected. When conditions of high flow exist, vessels must take into account o4verhead clearances, vessel draft, and available power. Bridge clearances are reduced so that many towboats cannot pass under the railroad bridge just below the lock. Shallow-draft vessels risk grounding on the lower guide wall which may be submerged. Fully laden barges, drawing 8 to 9 feet, under most circumstances may safely transit the lock by maintaining contact with the lower guide wall even when it is submerged. The outdraft from the dam can pull low or underpowered craft into the dam from the upper pool near the lock. In the lower pool, low or underpowered craft may be driven into the bank or the railroad bridge. When open and lighted, the outdraft sign must be heeded.

(600) **Marseilles Lock**, 27 miles below Dresden Island Lock, has a nominal lift of 24.25 feet. Spring thaws and rain runoff cause a maximum fluctuation of level of the lower pool of 9 feet. Once a year during this high level condition the lower guide wall is submerged, and shallow-draft vessels risk grounding. During conditions of high flow from the dam, vessels should exercise extreme caution when entering or exiting Marseilles Canal. A hazardous outdraft condition is indicated by an open and lighted outdraft warning sign at the head of the canal.

(601) **Starved Rock Lock**, 13 miles below Marseilles Lock, has a nominal lift of 18.7 feet. Variation in the lift can be as much as 17 feet depending on flow. Severe outdraft during moderate to high flow conditions makes downbound entry or upbound exiting of the lock difficult to dangerous. When the lower pool reaches a level of 450 feet above MSL 1929, shallow-draft vessels risk grounding on the lower guide wall or the bullnose on the lower left lock wall. Tows should exit the lock at a low rate of speed to prevent backlash.

(602) **Peoria Lock**, 73 miles below Starved Rock Lock, and **LaGrange Lock**, 77 miles below Peoria Lock, have nominal lifts of 11 and 10 feet, respectively. These locks were designed to accommodate flooding and have Chanoine Wicket dams for pool level control. The dams are lowered to the river bottom when the lower pool levels rise and approach the upper pool levels. When the dams are lowered to the river bottom, about 40 percent of the time, they are said to be in the "open pass" or "navigable pass" status. Tows should exit these locks at a low rate of speed to prevent backlash.

(603) Special restrictions are in effect concerning all locks and dams of the Illinois Waterway and the Chicago Lock at the mouth of the Chicago River. The restrictions are as follows: Boat crews, repairmen, and company officials will be permitted to embark or disembark at the above locations only after identification has been established satisfactorily to the lockmaster. Such identification can be established by the vessel master or pilot on duty personally signing a Necessity for Admission form which will be furnished by the lockmaster. The privilege of entering the lock premises is for the express purpose only of embarking or disembarking from a vessel, and shall not be construed as permission to use the reservation for waiting or any other purpose. Supplies, packages, and parcels, including laundry, will not be accepted by the lockmaster for delivery to or from vessels.

Navigation Charts

(604) Charts of the Illinois Waterway is a booklet of charts showing this maintained waterway from the Mississippi River at Grafton, Ill., to Lake Michigan at Chicago, Ill. The booklet is published and sold by the U.S. Army Corps of Engineers, Rock Island District. (See Appendix A for address.)

Light List

(605) Aids to navigation of the Illinois Waterway are contained in Light List, Volume VII, Great Lakes, and Light List, Volume V, Mississippi River System, for above and below the Lockport Lock, respectively. The Light List is available from the U.S. Government Printing Office. (See Appendix A for address.)

(606) From Chicago Harbor N for 13.5 miles to Wilmette, the shore is bordered by shoals and detached spots that extend 4 miles off. Carter H. Harrison Crib, 2.1 miles NNE of Chicago Harbor Light, is connected to William E. Dever Crib, close NE, by a bridge with a clearance of about 27 feet. William E. Dever Crib is marked by a private light with a fog signal. A **security zone** has been established in the waters of Lake Michigan around the William E. Dever Crib. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33 and 165.910**, chapter 2 for limits and regulations.)

Bridges across the Illinois River

***Miles from W end of Chicago Lock (41°53'18"N., 87°36'28"W.)**

****** Clear width in feet proceeding away from Lake Michigan**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Pool level	High water	
	Head of Illinois River at junction of Des Plaines and Kankakee Rivers		54.3						
	Dresden Island Lock		55.7						
1	Divine-Elgin, Joliet & Eastern Ry. bridge	Railroad	56.6			113	26	8	Vertical lift. Span raises 30.3 feet above heights shown. Notes 1 and 5.
2	Morris-State Route 47 bridge	Highway	63.8			350	50	34	Fixed.
3	Seneca-Chessie System RR bridge	Railroad	73.1			140	21	9	Vertical lift. Span raises 26.2 feet above heights shown. Notes 1 and 5.
4	Seneca-State Route 170 bridge	Highway	74.5			354	47	37	Fixed.
	Marseilles Canal	Highway	80.2						
5	Marseilles bridge	Highway	80.3			225	46	46	Fixed.
	Marseilles Lock		82.6						
6	Ottawa-State Route 23, Veterans Memorial Bridge	Highway	87.5			476	47	38	Fixed. Note 9.
7	Ottawa-Burlington Northern bridge	Railroad	87.8			167	21	12	Vertical lift. Span raises 26.4 feet above heights shown. WRD-810. Notes 5 and 8.
	Starved Rock Lock		96.2						
8	Utica-State Route 178 bridge	Highway	97.6			356	63	44	Fixed.
9	LaSalle-Route 412 bridge	Highway	101.5			582	66	44	Fixed. Under construction in October 1983.
10	LaSalle-Illinois Central RR bridge	Railroad	101.7			260	61	43	Fixed.
11	LaSalle (State Route 351) bridge	Highway	102.5			360	64	41	Fixed.
12	Peru-U.S. Route 51 bridge	Highway	104.3			400	62	44	Fixed.
13	Spring Valley-State Route 89 bridge	Highway	108.7			350	60	43	Fixed.
	Illinois and Mississippi Canal		117.0						
15	Hennepin I–180 bridge	Highway	119.4			350	59	42	Fixed.
16	Hennepin State Route 26 bridge	Highway	119.6			350	59	42	Fixed.
17	Henry-State Route 18 bridge	Highway	131.2			350	59	42	Fixed.
18	Lacon-State Route 17 bridge	Highway	138.0			350	59	41	Fixed.
19	Chillicothe-Atchison, Topeka & Sante Fe Ry. bridge	Railroad	145.3			360	58	41	Fixed.
20	Peoria-McCluggage Highway bridge	Highway	161.4			411	65	58	Dual fixed.
21	Peoria-Murray-Baker (I–74) bridge	Highway	164.5			500	65	48	Fixed.
22	Peoria-Franklin St. bridge	Highway	164.9			121	31	15	Bascule. WZQ-8761. Notes 1, 5, 7, and 8.
23	Peoria-Atchison, Topeka and Santa Fe RR bridge	Railroad	165.0		118		13	3	Swing. Note 2.
24	Peoria-Cedar St. State routes 8, 29, 116	Highway	165.6			280	78	62	Fixed arch. Clear heights are for 210-foot width.

Bridges across the Illinois River

***Miles from W end of Chicago Lock (41°53'18"N., 87°36'28"W.)**

****** Clear width in feet proceeding away from Lake Michigan**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Pool level	High water	
25	Peoria-Peoria & Pekin Union Ry. bridge	Railroad	166.5			307	19	2	Vertical lift. WQX-651. Notes 1, 5, 6, and 8.
26	Shade Lohmann I–474 bridge	Highway	169.2			500	64	48	Fixed.
	Peoria Lock		169.5						
27	Pekin-bridge-State route 9	Highway	174.3			430	72	56	Fixed.
28	Pekin-Chicago & North Western Ry. bridge	Railroad	176.0			153	30	9	Vertical lift. Span raises 41.7 feet above heights shown. KVF-831. Notes 5 and 8.
29	Havana-U.S. Route 136, State routes 78, 97, bridge	Highway	207.6			350	67	47	Fixed.
30	Beardstown-Burlington Northern bridge	Railroad	238.4			300	54	34	Vertical lift, KLU-801. Notes 4 and 8.
31	Beardstown-U.S. Route 67, State route 100 bridge	Highway	239.3			526	69	49	Fixed.
	LaGrange Lock		247.0						
32	Meredosia-State Route 104 bridge	Highway	255.9			554	72	47	Fixed.
33	Valley City-Norfolk Southern RR bridge	Railroad	265.9			300	32	6	Vertical lift. Span raises 45.5 feet above heights shown. KTR-857. Notes 6 and 8.
34	Valley City	Highway	266.9			535	71	55	Fixed. Under construction.
35	Valley City	Highway	267.1			540	71	55	Fixed. Under construction.
36	Florence-U.S. Route 36, State route 100 bridge	Highway	271.2			202	26	4	Vertical lift. Span raises 56.8 feet above heights shown. WZQ-8761. Notes 1, 5, and 8.
37	Pearl-Illinois Central Gulf RR bridge	Railroad	284.0			315	20	0	Vertical lift. Span raises 69.5 feet above heights shown. KLU-797. Notes 5 and 8.
38	Hardin-State Route 100 bridge	Highway	305.7			300	25	8	Vertical lift. Span raises 56.9 above heights shown. WZQ-8761. Notes 1, 5, and 8.
	Junction with Mississippi River		327.2						

Note 1.–Bridge signals are as follows: alternately flashing upper and lower vertically arranged green lights indicate draw is to open immediately, and alternately flashing right and left horizontally arranged red lights indicate draw cannot be opened immediately or must be closed immediately.

Note 2.–Swing span has been removed.

Note 3.–Bridge is kept in the open position except for the passage of a train.

Note 4.–See **CFR 117.1 through 117.59 and 117.393**, chapter 2, for drawbridge regulations. Bridge normally open, remotely controlled. Contact KLU-801 on VHF-FM channel 16, before transiting to ensure bridge remains open during passage.

Note 5.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 6.–Span raises about 47 feet above heights shown.

Note 7.–The bridgetender monitors VHF-FM channel 16 and works on channel 13.

Note 8.–The bridgetender monitors VHF-FM channel 16 and works on channel 14.

Note 9.–Clear heights are for 417-foot width.

(607) A submerged bulkhead, covered 2 feet, parallels the shoreline about 450 feet off, from 1.9 to 2.8 miles N of the Chicago River entrance. The bulkhead is marked at intervals by 5-foot-high piles. Small craft should not attempt to cross the bulkhead. At the S end of the bulkhead, a private light marks North Avenue Jetty.

(608) **Diversey Harbor** is a small-craft basin protected by breakwaters about 3 miles N of Chicago River entrance. The ends of the N and S breakwaters are seasonally marked by private lights. The controlling depths are about 9 feet in the entrance channel with 8 feet in the basin and shoaling toward shore. Mariners should use caution when using the harbor during high waves and swells. The entrance channel is crossed by a fixed highway bridge with a clearance of 14 feet. Vessel traffic control lights on the bridge are directed either direction in the channel and operate as follows: green, 10 minutes; red, 10 minutes. These lights operate 24 hours during good weather.

(609) **Belmont Harbor** is a small-craft basin 4 miles N of Chicago River entrance. The entrance to the basin is marked on the N side by private lights. The entrance channel has a controlling depth of about 17 feet, and the basin has central depths of 17 to 24 feet with shoaling toward shore. Gasoline, diesel fuel, ice, and sewage pump-out facilities are available in the basin.

(610) An 8-foot shoal, marked on the E side by a buoy, is 0.3 mile NE of the entrance to Belmont Harbor. An 11-foot shoal is 0.8 mile NE of the entrance.

Charts 14905, 14927, 14926

(611) The shore from Belmont Harbor N for 1.3 miles to Montrose Harbor is paralleled 16 feet off by a submerged shore-protection bulkhead, covered about 4½ feet. The bulkhead is marked at 20-foot intervals by 5½-foot-high piles. Small-craft should not attempt to cross the bulkhead.

(612) **Montrose Harbor** is a small-craft basin about 5 miles N of Chicago Harbor. The entrance to the basin, from S, is protected by two breakwaters, each marked on the outer end by a private light. The entrance channel has depths of about 18 feet with 17 feet in the basin. Sewage pump-out facilities are available in the basin.

(613) A breakwater, marked at the inner and outer ends by private lights, extends N from the point of land which forms the N and E sides of Montrose Harbor.

(614) Wilson Avenue Crib, marked by a private light with a fog signal, is 2.6 miles E of Montrose Harbor entrance. An automatic wave recorder, covered 6½ feet, is about 400 feet NW of the crib.

(615) A shoal with rock outcroppings covered 15 to 18 feet extends 3.5 miles offshore from about 1 to 4 miles N of Montrose Harbor.

(616) **Grossepoint Light** (42°04.0'N., 87°41.0'W.), 119 feet above the water, is a prominent private aid shown from a white conical tower with a red roof close to shore 7.3 miles N of Montrose Harbor and 1 mile S of Wilmette. An automatic wave recorder, 13 feet high, is close offshore 0.25 mile SE of the light.

(617) **Wilmette, Ill.,** is a small-craft harbor at the N terminous of North Shore Channel, about 13.5 miles N of Chicago Harbor. The harbor is used primarily by pleasure craft. The white dome of the Baha'i Temple 0.3 mile SW of the harbor entrance is prominent.

Channels

(618) The harbor is entered NW from deep water in Lake Michigan between two piers to an inner harbor basin. A breakwater extending E from the shore N of the entrance piers provides some protection from N winds. The outer ends of the piers and the breakwater are marked by private lights. In July 1978, the entrance channel was reportedly being maintained to a depth of 8 feet during the boating season. In 1971, the controlling depth in the basin was about 3 feet. In October 1987, shoaling to an unknown depth was reported at the entrance to the harbor, extending about 50 yards S from the Wilmette Harbor Entrance North Light.

Caution

(619) When approaching the harbor during periods of reduced visibility, mariners are cautioned against mistaking the breakwater for the N pier. Vessels approaching from the N are advised to pass well clear of the N pier before hauling around to the entrance.

(620) **Sluice Gate.**–To regulate the flow of water from Lake Michigan into North Shore Channel, a sluice gate has been constructed at the SW end of the harbor basin by the Chicago Sanitary District. A navigation lock in the structure is inoperable and blocks access from the harbor to the channel. Since there may be considerable current through the harbor when the gate is open, an oscillating red warning light is operated near the gate.

Coast Guard

(621) **Wilmette Coast Guard Station** is on the N side of the harbor basin.

Small-craft facilities

(622) Limited transient berths, gasoline, sewage pump-out facilities, and limited supplies are available in the harbor. A hoist can handle 30-foot craft for minor repairs.

Structures across Calumet Sag Channel
**Miles above Calumet Harbor Pierhead Light*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Low	High	
	Junction with Little Calumet River		13.48						
1	Ashland Ave. bridge	Highway	13.98			223	26		Fixed.
2	Overhead cable	Power	14.02				68		
3	Dan Ryan Expressway (I–57) bridge	Highway	14.04			225	41		Fixed.
4	Overhead cable	Power	14.47				43		
5	Division St. bridge	Highway	14.49			225	24		Fixed.
6	Chatham St. bridge	Highway	14.77			225	24		Fixed.
7	Western Ave. bridge	Highway	15.01			225	44		Fixed.
8	Chicago, Rock Island & Pacific RR bridge	Railroad	15.05			225	24		Fixed.
9	Baltimore & Ohio Chicago Terminal RR bridge	Railroad	15.37			225	24		Fixed.
10	Grand Trunk Western RR bridge	Railroad	15.38			225	24		Fixed.
11	Grand Trunk Western RR bridge	Railroad	15.39			225	24		Fixed.
12	Baltimore & Ohio Chicago Terminal RR bridge	Railroad	15.41			225	24		Fixed.
13	Grand Trunk Western RR and Chicago, Rock Island & Pacific RR bridge	Railroad	15.42			225	24		Fixed.
14	Francisco Ave. bridge	Highway	15.63			225	24		Fixed.
15	Overhead cable	Power	15.64				36		
16	Overhead cable	Power	15.82				60		
17	Kedzie Ave. bridge	Highway	16.01			225	24		Fixed.
18	Overhead pipeline		16.04				30		
19	Overhead pipeline		16.22				31		
20	Overhead cable	Power	16.25				54		
21	Overhead cable	Power	16.27				54		
22	Overhead pipeline		16.37				27		
23	Overhead cables	Power	16.81				60		
24	Crawford Ave. bridge	Highway	17.01			198	26		Fixed.
25	Northern Illinois Toll Highway bridge	Highway	17.35			225	39		Twin fixed.
26	Overhead cable	Power	17.48				59		
27	Overhead cable	Power	17.50				58		
28	Cicero Ave. bridge	Highway	18.08			198	24		Fixed.
29	127th St. bridge	Highway	18.81			225	24		Fixed.
30	Ridgeland Ave. bridge	Highway	20.47			225	24		Fixed.
31	Overhead cable	Power	21.44				67		
32	Overhead cable	Power	21.45				44		
33	Overhead cable	Telephone	21.47				35		
34	Harlem Ave. bridge	Highway	21.48			225	24		Fixed.

Structures across Calumet Sag Channel
Miles above Calumet Harbor Pierhead Light
****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Low	High	
35	Norfolk Southern RR bridge	Railroad	22.13			225	43		Fixed.
36	Overhead cable	Telegraph	22.16				37		
37	Southwest Highway bridge	Highway	22.25			188	26		Fixed.
38	Overhead cable	Power	22.27				62		
39	Overhead cable	Power	22.33				72		
40	Overhead cable	Power	22.37				72		
41	96th Ave. bridge	Highway	24.56			225	24		Fixed.
42	104th Ave. bridge	Highway	25.56			225	24		Fixed.
43	Overhead cable	Telephone	28.58				39		
44	Overhead cable	Power	28.60				68		
45	Sag Highway bridge	Highway	28.76			225	39		Fixed.
46	Overhead cable	Power	28.90				100		
47	Illinois Gulf Central RR bridge	Railroad	29.01			225	24		Fixed.
48	Overhead cable	Power	29.19				62		
	Junction with Chicago Sanitary and Ship Canal		29.44						

Chart 14905

(623) From Wilmette, the shore extends 21 miles NNW to Waukegan. This reach is low for the first 5 miles, thence has 70-foot bluffs N to Waukegan. In the vicinity of Wilmette, shoals extend 2.3 miles offshore, but over the rest of the reach, the shoal border is less than 2 miles wide. A wreck, covered 15 feet and marked by a lighted bell buoy, is 2 miles NE of Wilmette. A rocky spot, covered 22 feet and marked on the E side by a lighted bell buoy, is about 6 miles NE of Wilmette. **Glencoe Shoal,** reported to be covered 3 feet, is 1 mile offshore about 5.5 miles NNW of Wilmette. A detached 21-foot spot is 3.3 miles offshore about 3 miles N of Glencoe Shoal. In 1958, a wreck was reported 3.4 miles offshore 5.3 miles N of Glencoe Shoal.

(624) **Great Lakes Naval Training Center Harbor,** about 3.5 miles S of Waukegan, is a protected area of about 100 acres enclosed by breakwaters on the N, E, and S. The harbor is used by training vessels and by pleasure craft of personnel stationed at the base. Permission to enter the harbor must be obtained from the **harbormaster,** who may be contacted on VHF-FM channel 14, call Great Lakes Harbor, or at the boathouse, Building 13, in the inner basin. The harbor is available as a refuge during storm or other emergency.

(625) The N breakwater extends E from the shore and joins the E breakwater, which then extends S to the entrance channel. The S breakwater extends E from shore to the entrance channel. The outer ends of the breakwaters are marked by lights. In 1977, the entrance channel had a centerline controlling depth of 12 feet. A channel through the outer harbor has a depth of about 13 feet. From the outer harbor a channel leads between piers to an inner basin. The outer ends of the piers are marked by lights. The channel to the inner basin has a depth of about 14 feet.

(626) A **restricted area** extends 1 mile into Lake Michigan, from Great Lakes Naval Training Center Harbor S breakwater N for 1.6 miles. A **danger zone** for rifle firing practice extends 2 miles into the lake just N of the harbor. (See **33 CFR 334.820 and 334.830,** chapter 2, for limits and regulations.)

Charts 14904, 14905

(627) **Waukegan, Ill.,** is a city and small commercial harbor on the W side of Lake Michigan 35 miles N of Chicago Harbor. The principal cargoes handled in the port are bulk cement and gypsum rock. Prominent are stacks at the Commonwealth Edison Co. 1.5 miles N of the harbor and the light on the intake crib 2.1 miles N of the harbor.

(628) **Waukegan Harbor Light** (42°21'36"N., 87°48'48"W.), 36 feet above the water, is shown from a cylindrical tower with a green band on the outer end of the S pier; a fog signal is at the light. The light is sometimes difficult to distinguish from shore lights in the background.

Channels

(629) The harbor is entered through a dredged entrance channel leading W from deep water in Lake Michigan between parallel piers to an inner harbor basin. A breakwater extending from shore on the N side of the entrance channel protects the entrance from NE seas. The outer ends of the piers and breakwater are marked by lights. In 1989-May 1998, the controlling depths were 9.5 feet (17.3 feet at midchannel) in the entrance and channel between the piers to the inner harbor basin, thence in 1991-May 1998, depths of 12 to 13.2 feet were in the basin. The entrance channel is subject to shoaling caused by the drift of sand from the N. Above the dredged area, the inner basin has depths of 14 to 20 feet with shoaling to 8 feet and less at the N end.

(630) The inner basin is not adapted for anchorage, but vessels may moor to the revetment on the W side or in the slips N of the basin. During severe storms, vessels are sometimes required to moor in the middle of the slips and away from the docks to prevent damage to the vessels and revetments. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

Dangers

(631) A foul area with a number of detached rock ledges is E of the harbor entrance. The area is marked by a buoy on the E side and a lighted buoy on the N side. Mariners should keep to N of the lighted buoy.

Caution

(632) Sudden wind direction or barometric pressure changes may cause water levels in the harbor to rise or fall as much as 3 feet in a short time.

Harbor regulations

(633) Federal regulations specify a **speed limit** of 4 mph (3.5 knots) in the harbor. (See **33 CFR 162.120**, chapter 2, for regulations.)

(634) Local harbor regulations have been established by the Waukegan Port District and are enforced by the Executive Director, Port of Waukegan, whose office is at South Harbor Marina. Copies of the regulations can be obtained from the Executive Director, Port of Waukegan, 55 South Harbor Place, P.O. Box 620, Waukegan, Ill. 60079. A **speed limit** of 5 mph (4.3 knots) is enforced in the inner and outer harbor of Waukegan.

Towage

(635) Tugs are available in Waukegan at Kadinger Marine Services, Inc.

Wharves

(636) Waukegan has two deep-draft facilities in the slip on the NW side of the inner basin. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(637) **La Farge Cement Dock:** S side of the slip; 620-foot face; about 16 to 17 feet alongside; deck height, 7 feet; covered storage for 32,000 tons of bulk cement; receipt of bulk cement; owned by Waukegan Port Authority and operated by La Farge Cement Co.

(638) **National Gypsum Company Dock:** N side of the slip; about 750 feet of berthing space; 15 to 16 feet alongside; deck height, 4 to 5 feet; open storage for 120,000 tons of gypsum rock; owned by Elgin, Joliet, and Eastern Railway and operated by National Gypsum Company..

Small-craft facilities

(639) The Waukegan Port District operates a marina adjacent to the S pier of the entrance channel. The marina is entered from the S between protecting breakwaters and can provide 50 transient berths, gasoline, diesel fuel, electricity, water, ice, a launching ramp, and sewage pump-out.

Chart 14904

(640) The shore from Waukegan N for 16 miles to Kenosha is low with some woods behind the beach. Shoals extend no more than 0.8 mile offshore. Small craft should avoid the rock awash 50 yards off the mouth of Barnes Creek. The rock is about 2.2 miles N of Winthrop Harbor in about 42°31'24"N., 87°48'30"W.;

mariners are advised to pass well offshore of this obstruction.

(641) About 1.5 miles N of Waukegan, a breakwater extends 1,200 feet from shore to protect the intake channel of the Waukegan Generating Station, Public Service Co. The outer end of the breakwater is marked by a private light. A fish net is placed annually, between April and August, from the outer end of the breakwater to the shore about 1,200 feet SW. The net shows above the water and is marked by private buoys and floats. Three lighted stacks at the generating station are prominent from offshore.

(642) The towers of the Commonwealth Edison Co. nuclear powerplant (Zion Nuclear Power Plant) at **Zion**, 6 miles N of Waukegan, are reported to be prominent from offshore. A **security zone** has been established in the waters of Lake Michigan off the Commonwealth Edison Co. nuclear power plant. (See **CFR 165.1 through 165.8, 165.30 through 165.33, and 165.910**, chapter 2 for limits and regulations.)

(643) A large marina (42°29'05"N., 87°48'05"W.), along the Illinois shore is close E of the town of **Winthrop Harbor**, about 2 miles N of Zion.

(644) The marina basins are protected on the N and E sides by breakwaters. The S breakwater is marked by three lights. The N breakwater is marked by two lights. Both breakwaters have a light marking the entrance between the outer ends.

(645) Both the smaller N basin and the large S basin had a reported depth of 8 feet in 2006. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, launching ramps, haul-out to 70 tons, and full service marine repairs are available. The **harbormaster** monitors VHF-FM channel 16.

(646) The **State boundary** between Illinois and Wisconsin is about 9 miles N of Waukegan and 7 miles S of Kenosha.

(647) **Prairie Cove** is a small-craft harbor on the Illinois-Wisconsin State boundary. There is a private marina in the harbor. The harbor is marked by private lights and buoys. In August 1993, the reported controlling depth in the harbor was 8 feet. The Harbormaster monitors VHF-FM channels 16 and 9.

(648) **Kenosha Harbor**, 50 miles N of Chicago Harbor at the original mouth of **Pike Creek,** serves as a base for commercial fisherman and pleasure craft. The harbor serves the city of **Kenosha, WI.**

Prominent features

(649) Prominent from the lake are a white tank on the N side of the entrance channel and a radio tower 3.2 miles WSW of Kenosha Light.

(650) **Kenosha Light** (42°35.4'N., 87°48.5'W.), 50 feet above the water, is shown from a red conical tower on the outer end of the N pier; a fog signal is at the light. Kenosha Light and the light on the SE end of the detached breakwater form a range useful for approaching the harbor entrance.

Channels

(651) The harbor is entered through a dredged entrance channel leading from deep water in Lake Michigan between parallel piers to an inner harbor basin. A detached breakwater on the N side of the entrance channel protects the entrance from NE seas. The outer ends of the piers and breakwater are marked by lights. In November 2006, the controlling depths were 7.1 feet in the entrance channel to the basin, thence 18 to 24 feet in the basin with lesser depths along the W edge, thence 11.2 feet to the 50th Street bridge.

(652) The entrance channel is subject to shoaling caused by the drift of sand from the N. Severe E gales cause considerable disturbance in the basin. The inner basin is not adapted for anchorage, but vessels may moor to the revetments surrounding it. Mooring to the breakwater or piers is prohibited.

Caution

(653) The original mouth of Pike Creek has been bulkheaded and filled. The creek has been diverted and now enters the harbor basin at the foot of 52nd Street through a 13-foot pipe. The creek flows into the harbor with velocities to 2 mph.

Bridge

(654) The 50th Street bridge at the N end of the dredged part of the basin has a fixed span with a clearance of 16 feet.

Harbor regulations

(655) A **slow no-wake speed limit** exists in the area from the breakwaters at the E end of the harbor entrance to above the 50th street bridge at the end of the basin.

Coast Guard

(656) **Kenosha Coast Guard Station** is on the E side of the inner basin.

Small-craft facilities

(657) A large public marina is about 0.4 mile SW of the harbor entrance. The marina is protected by breakwaters and the entrance is marked by private lights. Marinas are also located inside the harbor above and below the 50th Street bridge. Transient berths, gasoline, diesel fuel, water, ice, electricity, limited marine supplies, sewage pump-out, launching ramp, haul-out to 60 tons, and harbormaster services are available.

(658) From Kenosha, the shore is bluff for 10 miles N to Racine. The shoal border is less than 1 mile wide with several detached spots beyond. About 1 mile N of Kenosha, 20- and 23-foot spots are 1 and 1.6 miles off-shore, respectively. A prominent lighted cross is 1.3 miles NNW of Kenosha Harbor. A wreck, covered 30 feet, is 1.2 miles offshore and 4 miles N of Kenosha Harbor. Detached 21-foot spots are 1 mile and 1.4 miles offshore, 2.4 and 3.8 miles S of Racine, respectively.

Charts 14904, 14925

(659) **Racine Reef,** SE of the entrance to Racine Harbor, is a large shoal extending from 0.6 to 2.3 miles offshore. The reef has a least depth of 1 foot over a crib near its center. **Racine Reef Light** (42°43.6'N., 87°44.2'W.), 50 feet above the water, is shown from a white skeleton tower on a concrete crib on the E side of the reef; a fog signal is at the light. The light should not be passed close aboard even by shallow-draft vessels. The W end of the reef is marked by a lighted buoy.

(660) **Racine Harbor,** serving the city of **Racine, Wis.,** is at the mouth of the **Root River,** 60 miles N of Chicago Harbor and 21 miles S of Milwaukee Harbor. The harbor is used primarily by pleasure craft and fish tugs.

(661) A small-craft facility is in the S part of the outer harbor basin. A launching ramp basin is just S of the outer harbor basin. The entrances to the basins are marked by lighted buoys and lights.

Channels

(662) From the outer harbor basin, a dredged channel in the Root River leads upstream for about 0.7 mile to just below Fourth Street. In May 1992, the reported controlling depths were 15 feet to the mouth of Root River, thence 11 feet to the Main Street bridge, thence 8 feet near midchannel to the head of the project. Above the dredged channel, depths are about 4 feet to about 200 yards below Marquette Street bridge, thence depths of 1 to 4 feet for about 2.5 miles above Marquette Street bridge. There are rocks on the river bottom just inside the mouth between the N channel limit and the N revetment.

(663) The outer basin is not adapted for anchorage by large vessels but reduces wave action in the lower section of the river. Mooring to the breakwaters and the pier on the N side of the river mouth is prohibited.

Structures across Root River at Racine
***Miles above the mouth of the river**
****Clear width in feet proceeding upstream**

No.	Location and Name	Kind	Miles*	Clear width on feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
1	Main St. bridge	Highway	0.31			90	18	Bascule. Note 1.
2	State St. bridge	Highway	0.53			69	12	Bascule. Notes 1, and 2.
3	Overhead cable	Power	0.97				53	
4	Marquette St. bridge	Highway	1.17	58	58	58	9	Fixed.
5	Overhead cable	Power	1.27					Data not available
6	Overhead pipeline		1.32			137	12	
7	Sixth St. bridge	Highway	1.46			49	24	Fixed.
8	Chicago & North Western Ry. bridge	Railroad	1.65	107	107		17	Fixed. Note 2.

Note 1.–See **33 CFR 117.1 through 117.59 and 117.1095**, chapter 2, for drawbridge regulations.

Note 2.–Neither draw is accessible. The depth would only permit passage of very small boats.

Note 3.–In 1986, the bridge was being replaced by a bascule bridge with design clearance of 14 feet at the W channel limit and 19 feet at the E limit.

Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(664) The channel inside the river is narrow and tortuous, making navigation for large vessels difficult. Currents in the river attain velocities to 3 mph.

Dangers

(665) Several detached shoal spots with depths of 21 to 24 feet are 0.3 to 1.1 miles NE of the harbor entrance. Racine Harbor is subject to considerable wave action during periods of strong winds from NE to SE.

Local bridge regulations

(666) In case street traffic is delayed by reason of the draws of either bridge having been continuously opened for 5 minutes or more for the passage of boats, the draws may be closed, but shall be again opened for the passage of boats as soon as practicable; provided however, that no boat shall be delayed for a longer period than 15 minutes.

(667) In case the draw cannot be immediately opened when a signal is given, a red flag or ball by day or a red light at night shall be conspicuously displayed.

(668) All boats when passing any bridge in the city shall be moved past as expeditiously as is consistent with proper movement in the river, and in no case shall any boat, while passing any bridge and obstructing the same, remain or obstruct the passage across such bridge more than 5 minutes, nor shall any boat be so anchored or fastened as to prevent the free and speedy opening of any bridge or the free passage of other boats through the same.

(669) No person shall in any manner obstruct the free passage over and upon the bridges of the city.

(670) No person except the bridgetender or person authorized to act in his stead shall open or in any manner interfere with opening any bridge.

(671) The person having charge of any boat desiring to move past any bridge shall allow a reasonable time for the opening of such bridge, and no person shall move any boat against any bridge or draw thereof before the bridge is opened.

(672) No person shall willfully injure or damage any bridge or abutment, or part thereof. No person shall fasten or hitch any boat, timber or other floating material to any bridge or abutment.

(673) No person shall damage or remove any portion of the improved shore protection of any navigable waters within the city.

(674) Any person who violates any provision of this section shall, upon conviction thereof, be liable for the cost of repairing any damage resulting from such violation, in addition to the penalty provided for violation of this code.

(675) Racine is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(676) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(677) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Harbor regulations

(678) Federal regulations specify a **speed limit** of 4 mph (3.5 knots) in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(679) Local harbor regulations are under the control of the harbor commission and are enforced by the **harbormaster** who can be reached through the Racine County Water Patrol. A **slow-no wake speed** is enforced within the harbor limits. Copies of the regulations can be obtained from the Commissioner of Public Works, City Hall, 730 Washington Avenue, Racine, Wis. 53403.

Small-craft facilities

(680) Marinas at Racine provide transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps. Hoists to 25 tons are available for hull, engine, and electronic repairs.

(681) From Racine Harbor, the shore is bluff and curves NE for 3.5 miles to **Wind Point**. Shoals extend about 0.9 mile offshore. Detached 21- and 20-foot depths are 1.1 miles NE and 1.3 miles NNE of the entrance to Racine Harbor. **Wind Point Light** (42°46.9'N., 87°45.5'W.), 111 feet above the water, is shown from a white conical tower with attached dwelling on the point.

(682) **Wind Point South Shoal,** with a least depth of 17 feet, is 1.3 miles SE of Wind Point Light. The shoal is marked on the E side by a buoy.

Chart 14904

(683) **Wind Point North Shoal**, with boulders covered 14 feet and marked on the SE side by a lighted buoy, is 1.7 miles NE of Wind Point Light. All vessels should keep well outside the buoy, especially in heavy weather.

(684) From Wind Point, the shore trends NW and then N for 18 miles to Milwaukee Harbor. The shore in this stretch is bluff. For the first 7 miles of the stretch, shoals extend about 0.6 mile offshore, thence N to Milwaukee, the shoal border is irregular and extends as much as 1.5 miles from shore. A detached bank with a least depth of 18 feet is from 1.2 to 2 miles offshore in the vicinity of South Milwaukee, about 9.5 miles N of Wind Point. The greatest extent of the shoal border is 3.5 miles SE of the entrance to Milwaukee Harbor and is marked at the outer edge by a lighted bell buoy. Vessels should stay outside the buoy. A wreck, covered 27 feet, is marked by a lighted buoy 5.3 miles NE of South Milwaukee.

Caution

(685) A firing area for small caliber weapons is at the Racine County Line Rifle Club Range about 3.5 miles NW of Wind Point. The firing creates a caution zone about 3,500 feet wide extending about 3 miles into the lake. Mariners should navigate the area with caution and consult the Local Notice to Mariners for latest information.

(686) **Oak Creek Harbor** is a private harbor of the Wisconsin Electric Power Co., about 5.6 miles NW of Wind Point. Two stacks at the powerplant, the northernmost lighted, are prominent from the lake. A fill area for coal storage extends about 900 feet into the lake and has a combined water intake and docking slip along its S side. The slip is protected by a breakwater on the N side of the entrance and along the S side by a jetty. In 1977, the reported controlling depth was 21 feet in the approach with 20 feet in the N half of the slip and 15 feet in the S half. In 1993, it was reported that the slip was being maintained to a depth of about 20 feet. Strong currents may exist at the W end of the slip due to a large volume of plant intake water.

(687) About 3 miles N of Oak Creek Harbor, the city of Milwaukee has constructed a sewage treatment plant on a landfill that extends about 1,000 feet into the lake. A stack about 0.5 mile S of the plant is prominent.

(688) **South Milwaukee, Wis.**, is at the mouth of **Oak Creek**, about 8.5 miles S of the entrance to Milwaukee Harbor. Clay bluffs N and S of the creek mouth have an elevation of 60 feet or more. A rock jetty extends lakeward from the N side of the mouth of the creek. A row of submerged piling extends about 200 feet lakeward from the end of the rock jetty. Another pier extends from the S side of the mouth and then bends SW to enclose a small-craft basin. The S side of the basin is enclosed by a breakwater extending from shore. In 1978, the reported controlling depths were 6 feet in the entrance and 4 feet in the basin. Gasoline is available in the basin.

Charts 14904, 14924

(689) **Milwaukee Harbor**, serving the city of **Milwaukee, Wis.,** is one of the major ports on the Great Lakes. The harbor is at the mouth of the **Milwaukee River,**

which flows into **Milwaukee Bay,** a broad indentation on the W side of Lake Michigan about 80 miles N of Chicago Harbor. The harbor comprises an outer harbor formed by breakwaters paralleling the shore and an inner harbor in Milwaukee River, **Menomonee River,** and **Kinnickinnic River.** The principal cargoes handled in the port are general cargo, steel products, coal, cement, and grain. Freighters and petroleum tankers ply the waters year round between this port and other ports on S Lake Michigan.

Prominent features

(690) Prominent are lighted television towers 4.5 miles N of the Milwaukee River mouth, the U.S. Bank Center 0.95 mile NNW of the river mouth, a stack 0.4 mile SW of the river mouth, the Allen-Bradley Co. clock and temperature towers 1 mile SW of the river mouth, and an apartment building close SW of the Coast Guard Base at the S end of the outer harbor.

(691) **Milwaukee Breakwater Light** (43°01.6'N., 87°52.9'W.), 61 feet above the water, is shown from a black lantern on a white square structure on the end of the breakwater on the N side of the main entrance channel; a fog signal is at the light.

Channels

(692) Milwaukee outer harbor is protected by a series of breakwaters which generally parallel the shore on either side of the mouth of Milwaukee River. The main entrance to the harbor is through a dredged channel which leads from deep water in Lake Michigan between the breakwaters across the outer harbor to the mouth of the river. The ends of the breakwaters at the main entrance are marked by lights. The breakwater gaps at the N and S ends of the outer harbor are marked by lights. A dredged anchorage basin extends S from the entrance channel between the breakwater and the deep-draft piers along the shore.

(693) The inner harbor is entered from the outer harbor through the piers at the mouth of the Milwaukee River. The outer ends of the piers are marked by lights. The Milwaukee River flows from the N and is joined by the Menomonee River from the W about 1 mile above the pierheads and by the Kinnickinnic River from the S at the inner end of the piers at the NW end of **Jones Island.** Channels have been dredged in the lower parts of the rivers, for about 1.2 miles in the Milwaukee River, 1.7 miles in the Menomonee River, and 1.2 miles in the Kinnickinnic River. The channels are narrow and tortuous and are not provided with turning basins. Several of the bridge openings are also narrow and their navigation difficult. Channels have also been dredged in the **South Menomonee Canal** and **Burnham Canal,** which branch S from the Menomonee River just above its mouth.

(694) The Federal project depths are 30 feet in the approach channel from deep water in Milwaukee Bay, thence 28 feet in the entrance channel to the lakeward ends of the piers and in the outer harbor basin S of the entrance channel, thence 27 feet in Milwaukee River and Kinnickinnic River to the first railroad bridge on each river, thence 21 feet in the remainder of Kinnickinnic River to the S. First Street bridge and in Milwaukee River to E. Buffalo Street, thence 21 feet in Menomonee River to N. Twenty-fifth Street, and 21 feet in Burnham Canal to S. Eleventh Street and South Menomonee Canal. (See Notice to Mariners and latest edition of charts for controlling depths.)

(695) In the outer harbor, mooring to the breakwaters or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by rock riprap along their sides.

(696) In the outer harbor, S of the entrance channel, the city of Milwaukee has dredged the pier slips on the W side of the anchorage basin. South Slip No. 1 has been dredged to 26 feet and South Slip Nos. 2 and 3 have been dredged to 27 feet.

(697) Municipal Mooring Basin, also known as Kinnickinnic Basin, is on the SE side of the Kinnickinnic River about 0.6 mile above the mouth. The basin, used primarily for the winter moorage of vessels, has general depths of 25 to 30 feet with lesser depths along the edges.

(698) A diked disposal area extends from shore in the SW corner of the outer harbor. The SE corner of the area is marked by a light.

Anchorages

(699) Deep-draft vessels may find anchorage in the dredged part of the outer basin S of the entrance channel. Medium-draft vessels may anchor in the N part of the outer harbor, taking care to avoid dropping or dragging anchor in the vicinity of the submerged cables which cross the outer harbor just N of the entrance channel. Special anchorages are in the small-craft basins at the N end of the outer harbor and shoreward of the County Park Commission's breakwater which parallels the shore S of the outer harbor. (See **33 CFR 110.1 and 110.80,** chapter 2, for limits and regulations.)

(700) In April 1983, sunken wrecks were reported in the special anchorage areas behind the County Park Commission's breakwater 0.2 mile, 174° from South Shore Park Breakwater Light in about 42°59'58"N., 87°53'04"W., and 1.3 miles, 139° from South Shore Park Breakwater Light in about 42°59'17.6"N., 87°52'04.0"W.

Dangers

(701) During rough weather, the entire breakwater system may be obscured by wave action. At these times, the only safe entrance is through the main entrance channel.

(702) A wreck, covered 40 feet, is about 3.8 miles E of the harbor entrance.

Caution

(703) Fish nets in the N outer harbor are a hazard. A water intake for a sewage disposal plant is on the S side of the Milwaukee River about 800 feet W of the Interstate 794 highway bridge and may, at times, cause hazardous crosscurrents for small vessels.

(704) Navigators are advised to use extreme caution when entering slips of the general cargo terminals in the outer harbor. Ships accidentally penetrating the dock wall or ships having a large rake angle of the bow can strike the steel and concrete superstructure of Interstate 794 highway bridge. This could result in heavy ship or bridge damage and possible personal injury or loss of life.

(705) **Vessels moored in the outer harbor may be subject to severe surging when there are strong NNE to ENE winds. During periods of adverse weather, the Coast Guard recommends that vessels moored in the outer harbor be adequately manned at all times to maintain mooring lines and/or safely get underway.**

Currents

(706) Currents attain velocities to 4 mph in the main entrance channel and 3 mph in the river channels.

Weather, Milwaukee and vicinity

(707) Milwaukee, WI, is located on the western shore of Lake Michigan and in the southeastern portion of the state. The location averages about ten days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 80°F (26.7°C) and an average minimum of 62°F (16.7°C). January is the coolest month with an average high of 27°F (-2.8°C) and an average minimum of 13°F (-10.6°C). The highest temperature on record for Milwaukee is 103°F (39.4°C) recorded in August 1988 and again in July 1995 and the lowest temperature on record is -26°F (-32.2°C) recorded in January 1982. About 139 days each year experience temperatures below 32°F (0°C) and an average 21 days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 40°F (4.4°C) except August

and every month except June, July, and August has recorded temperatures below freezing (0°C).

(708) The average annual precipitation for Milwaukee is 32.23 inches (819 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter months. Precipitation falls on about 198 days each year. The wettest month is July with 3.61 inches (92 mm) and the driest, February, averages only 1.44 inches (37 mm). An average of 36 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 77 days each year and averages about 49 inches (1245 mm) each year. January averages about 13 inches (330 mm) per year and December averages nearly 11 inches (279 mm). One foot (305 mm) snowfalls in a 24-hour period have occurred in each month December, January, February and April. About ten days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June through September. Fog is present on average 137 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer and then again in the early winter.

(709) The prevailing wind direction in Milwaukee is the west-northwest. Spring is the windiest period and a maximum gust of 70 knots occurred in July 1984.

(710) (See Page 543 for **Milwaukee climatological table.**)

Towage

(711) Tugs to 1,600 hp are available at Milwaukee. Arrangements for tugs are made through the Great Lakes Towing Co. dispatcher in Cleveland (800-321-3663) or via VHF-FM remote antenna; at least 4 hours advance notice is requested. Arrangements for tugs can also be made through the JMS Towing Service, Inc. in Sturgeon Bay (414-743-9611).

(712) Milwaukee is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(713) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(714) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Structures across Milwaukee, Menomonee, and Kinnickinnic Rivers
**Miles above Milwaukee Pierhead Light*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Milwaukee River							
1	Lake Freeway (I-794) bridge	Highway	0.19			200	120	Fixed. Note 2.
	Junction with Kinnickinnic River		0.38					
2	Union Pacific RR bridge	Railroad	0.59	87	87		7	Swing. Note 1.
3	Broadway St. bridge	Highway	0.79			100	14	Bascule. Note 1.
4	Water St. bridge	Highway	0.94			130	14	Bascule. Note 1.
	Junction with Menomonee River		1.01					
6	St. Paul Ave. bridge	Highway	1.21			50	14	Vertical lift. Note 1.
7	East-West Exp. (I–794) bridges	Highway	1.26			116	28	Twin fixed.
8	Clybourn St. bridge	Highway	1.28			52	14	Vertical lift. Note 1.
9	Michigan St. bridge	Highway	1.37			50	12	Vertical lift. Clearance up 28 feet Note 1.
9A	Skywalk	Pedestrian	1.41			160	32	Fixed.
10	Wisconsin Ave. bridge	Highway	1.46			50	12	Vertical lift. Clearance up 28 feet. Note 1.
10A	Skywalk	Pedestrian	1.48			145	29	Fixed.
11	Wells St. bridge	Highway	1.61			77	9	Bascule. Note 1.
12	Kilbourn Ave. bridge	Highway	1.70			100	14	Bascule. Note 1.
13	State St. bridge	Highway	1.79			80	14	Bascule. Note 1.
14	Overhead cable		1.88					Data not available.
15	Juneau Ave. bridge	Highway	2.06			90	14	Bascule. Note 1.
16	Park Freeway bridges	Highway	2.13			116	35	Twin fixed.
17	Cherry St. bridge	Highway	2.29			80	14	Bascule. Note 1.
18	Pleasant St. bridge	Highway	2.58			50	14	Vertical lift. Clearance up 27 feet. Note 1.
19	Holton St. bridge	Highway	2.84			79	64	Bascule. Note 1.
20	Humboldt Ave. bridge	Highway	3.22				17	Fixed. Head of navigation.
	Menomonee River							
21	Canadian Pacific Railway bridge	Railroad	1.05	75			8	Swing. Note 1.
22	North Plankinton Ave. bridge	Highway	1.08			90	14	Bascule.
23	North Sixth St. bridge	Highway	1.37			92	23	Bascule. Note 1.
24	North-South Freeway (I–94) bridge	Highway	1.61			140	100	Fixed.

Structures across Milwaukee, Menomonee, and Kinnickinnic Rivers
Miles above Milwaukee Pierhead Light
****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
25	Muskego Ave. bridge	Highway	1.95			75	12	Bascule. Note 1.
26	Sixteenth St. bridge	Highway	2.14			120	35	Bascule. Note 1.
27	Twenty-fifth St. bridge	Highway	2.8	65	70			Fixed. Note 3.
28	Canadian Pacific Railway bridge	Railroad	2.91			9		Fixed. Head of navigation.
	South Menomonee Canal							
29	South Sixth St. bridge	Highway	1.51			80	14	Bascule. Note 1.
30	North-South Freeway (I–94) bridge	Highway	1.75			140	100	Fixed.
	Burnham Canal							
31	Canadian Pacific RR bridge	Railroad	1.74		65		8	Swing. Note 1.
32	North-South Freeway (I–94) bridge	Highway	1.79			95	80	Fixed.
33	South Eleventh St. bridge	Highway	1.96	46	45		7	Swing.
	Kinnickinnic River							
34	Union Pacific Railway bridge	Railroad	1.19	61	61		8	Swing. Note 1.
35	Kinnickinnic Ave. bridge	Highway	1.67			100	12	Bascule. Note 1.
36	Canadian Pacific Railway bridge	Railroad	1.67	93			15	Swing. Note 1.
37	Union Pacific RR bridge	Railroad	1.71	93			15	Swing. Note 1.
38	South First St. bridge	Highway	1.78			70	14	Bascule. Note 1.
39	Overhead cables	Power	2.00				30	
40	Becher St. bridge	Highway	2.02			50	12	Fixed.
41	Overhead cable		2.09					Data not available.
42	Overhead cable		2.11					Data not available.
43	Lincoln Ave. bridge	Highway	2.30				10	Fixed. Head of navigation.

Note 1.–See **33 CFR 117.1 through 117.59 and 117.1093**, chapter 2, for drawbridge regulations.

Note 2.–The minimum vertical clearance at the channel limits is 96 feet.

Note 3.–Vertical clearance is 16 feet at N edge of the channel decreasing to 10 feet at the S edge.

Coast Guard

(715) Milwaukee Coast Guard Station, Group Office, and Base are at the S end of the outer harbor. A **Marine Safety Office** is in Milwaukee. (See Appendix A for address.)

Harbor regulations

(716) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations are enforced by the **harbormaster.** Copies of these regulations may be obtained from the Legislative Reference Bureau, Room 404, City Hall, 200 East Wells Street, Milwaukee, Wis. 53202.

Wharves

(717) Milwaukee has numerous wharves, piers, and docks in the outer harbor and in the Milwaukee,

Menomonee, and Kinnickinnic Rivers. Only the deep-draft facilities are described. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Special cargo handling equipment is described with the individual facility. Cranes to 220 tons are available in the harbor. All the facilities have highway connections and some have railway connections. Water and electrical shore-power connections are available at some of the facilities.

Facilities in the outer harbor:

(718) **Port of Milwaukee South Slip No. 1, Bulk Cargo Dock** (43°01'18"N., 87°53'44"W.): 0.2 mile S of the river mouth; 780-foot E face, 23 to 26 feet alongside; 1,320-foot S face, 25 to 27 feet alongside; deck height, 11 feet; open storage for 90,000 tons of bulk materials; receipt and shipment of miscellaneous bulk materials, including sand, salt, gravel, and coal; mooring vessels on E side; owned by Port of Milwaukee and operated by Milwaukee Bulk Terminals, Inc.

(719) **Port of Milwaukee South Pier No. 1, North Side Open Dock** (43°01'12"N., 87°53'46"W.): 0.3 mile S of the river mouth; 945-foot face; 25 to 27 feet alongside; deck height, 11 feet; use of cranes from General Cargo Terminal No. 2; tank storage for 200,000 barrels; receipt and shipment of conventional and containerized general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metal; receipt of petroleum products; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd. and PTW, Inc.

(720) **Port of Milwaukee South Pier No. 1, General Cargo Terminal No. 2** (43°01'10"N., 87°53'44"W.): 0.35 mile S of the river mouth; 330-foot face, 25 feet alongside; 978-foot S side, 26 to 27 feet alongside; deck height, 11 feet; 3 crawler cranes to 120 tons; 1 mobile crane, 25 tons; 2 locomotive cranes to 34 tons; tank storage for 200,000 barrels; receipt and shipment of conventional general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metals; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(721) **Port of Milwaukee South Pier No. 2, General Cargo Terminals Nos. 3, 4, and 4A** (43°01'06"N., 87°53'40"W.): 0.45 mile S of the river mouth; 945-foot N side, 25 to 30 feet alongside; 545-foot face, 26 to 28 feet alongside; 1,005-foot S side, 26 to 29 feet alongside; deck height, 12 feet; use of cranes from General Cargo Terminal No. 2; 1.6 acres open storage; receipt and shipment of conventional and containerized general cargo in foreign and domestic trade, including steel products, dry bulk commodities, and scrap metal; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(722) **Port of Milwaukee Liquid Cargo Pier** (43°00'50"N., 87°53'30"W.): 0.8 mile S of the river mouth; 1,066-foot N side, 20 to 27 feet alongside; 1,088-foot S side, 20 to 27 feet alongside; deck height, 11 feet; storage tanks for 285,700 barrels; receipt of asphalt; owned by Port of Milwaukee, and operated by Jacobus Petroleum Products.

Facilities in the Kinnickinnic River:

(723) **Port of Milwaukee, Municipal Heavy-Lift Dock** (43°01'07"N., 87°54'07"W.): E side of Kinnickinnic River 0.35 mile above the mouth; 1,659-foot face; 22 to 28 feet alongside; 160-foot N side; 14 to 25 feet alongside; deck height, 6 feet; cranes to 220 tons; 5 acres open storage; receipt and shipment of conventional and containerized general cargo, heavy-lift items, and dry bulk commodities including steel products and scrap metal; owned by Port of Milwaukee and operated by Meehan Seaway Service Ltd.

(724) **Port of Milwaukee, North Bulk Cargo Wharf** (43°00'55"N., 87°54'02"W.): outer end of E side of Municipal Mooring Basin; 1,270-foot face; 25 feet alongside; deck height, 6 feet; open storage for 290,000 tons of salt, storage domes, capacity 30,000 tons; receipt of salt; owned by Port of Milwaukee, and operated by North American Salt Co.

(725) **Port of Milwaukee, South Bulk Cargo Wharf** (43°00'35"N., 87°53'53"W.): inner end of E side of Municipal Mooring Basin; 1,930-foot face; 19 to 25 feet alongside; deck height, 7½ feet; open storage for 57,000 tons of salt; covered storage for 15,000 tons of salt; receipt of bulk salt; owned by Port of Milwaukee, and operated by Akzo Nobel Salt, Inc.

(726) **Continental Grain Co., Kinnickinnic Elevator Wharf** (43°00'46"N., 87°54'08"W.): outer end of W side of Municipal Mooring Basin; 1,490-foot face; 27 to 28 feet alongside; deck heights, 6 and 9 feet; 3¼-million-bushel grain elevator; one marine leg, unloading rate 12,000 bushels per hour; 6 vessel-loading spouts, loading rate 9,000 bushels per hour each; receipt and shipment of grain; owned by Chicago and North Western Railway and operated by Continental Grain Co.

(727) **Southdown Cement Co. Dock** (43°00'31"N., 87°54'26"W.): E side of river below Kinnickinnic Avenue bridge; 550-foot face; 20 feet alongside; deck height, 5 feet; storage silos for 264,000 tons of cement; receipt of bulk cement; owned and operated by Southdown Cement Co.

(728) **Wisconsin Wrecking Co. Wharf** (43°00'46"N., 87°54'18"W.): W side of the river above Chicago and

North Western Railway bridge; 670-foot face; 22 feet alongside; deck height, 7 feet; 45 acres of open storage; receipt and shipment of crushed stone; owned and operated by Wisconsin Wrecking Co.

(729) **Milwaukee Bulk Terminal Wharf** (43°00'55"N., 87°54'14"W.): W side of the river, about 0.25 mile below the Chicago and North Western Railway bridge; 826-foot face, 27 feet alongside; deck height, 5 feet; open storage for 400,000 tons of coal; receipt and shipment of coal and miscellaneous dry bulk materials; owned by Port of Milwaukee and operated by Milwaukee Bulk Terminals, Inc.

(730) **Construction Resources Management Wharf** (43°01'10"N., 87°54'20"W.): S side of slip on W side of river 0.35 above the mouth; 723-foot N face, 14 feet alongside; deck height, 4 feet; storage tanks for 47,600 barrels; receipt and shipment of asphalt; owned and operated by Construction Resources Management, Inc.

(731) **Miller Compressing Co. Dock** (43°01'11"N., 87°54'18"W.): N side of the slip on W side of river 0.35 mile above the mouth, and the riverfront adjacent downstream; 600-foot S side, 12 to 27 feet alongside; 710-foot E face, 20 to 27 feet alongside; deck height, 6 feet; cranes to 50 tons; 10 acres open storage; shipment and receipt of scrap metal; owned and operated by Miller Compressing Co.

Facilities in the Menomonee River:

(732) **St. Mary's Cement Co., Milwaukee Terminal Dock** (43°01'56"N., 87°55'15"W.): S side of the river 0.1 mile above North Sixth Street bridge; 490-foot face; 17 to 25 feet alongside; deck height, 6 feet; silo storage for 22,550 tons of cement; receipt of cement; owned and operated by St. Mary's Cement Co.

(733) **Tews Co., Dock** (43°01'59"N., 87°56'04"W.): N side of the river above the Sixteenth Street bridge; 720-foot face; 35 feet alongside; deck height, 6 feet; open storage for 250,000 tons of stone; receipt of stone, owned and operated by Tews Co.

Facilities in South Menomonee Canal:

(734) **Wisconsin Electric Power Co., Valley Plant Coal Dock** (43°01'42"N., 87°55'25"W.): N side of the canal above North-South Freeway bridge; 660-foot face; 18 to 21 feet alongside; deck height, 7½ feet; open storage for 250,000 tons of coal; receipt of coal; owned and operated by Wisconsin Electric Power Co.

(735) **Didon, Milwaukee Terminal Wharf** (43°01'41"N., 87°55'31"W.): S side of the canal just below the head; 910-foot face; 21 feet alongside; deck height, 6 to 6½ feet; 2½-million-bushel grain elevator; two loading spouts, combined rate 26,000 bushels per hour; occasional shipment of grain; owned by J.R. Investments and operated by Didon, Inc.

Facilities in Burnham Canal:

(736) **Lafarge Corp., Milwaukee Terminal Wharf** (43°01'35"N., 87°55'29"W.): N side of the canal below South Eleventh Street bridge; 400-foot face; 19 to 21 feet alongside; deck height, 3 feet; silo storage for 18,000 tons of cement; receipt of bulk cement; owned by Lafarge Corp., Great Lakes Division and operated by Lafarge Corp. and Selvic Marine Towing Corp.

Supplies

(737) All types of marine supplies and provisions are available in Milwaukee. Bunker fuel and diesel oil are available by truck to facilities on Jones Island. Water is available at all the municipal docks and at some of the private facilities.

Repairs

(738) There are no facilities for drydocking deep-draft vessels at Milwaukee. Two companies on the E side of the Municipal Mooring Basin perform above- the-waterline and major engine repairs. Another company maintains portable equipment for making above-the-waterline repairs to vessels at their berths.

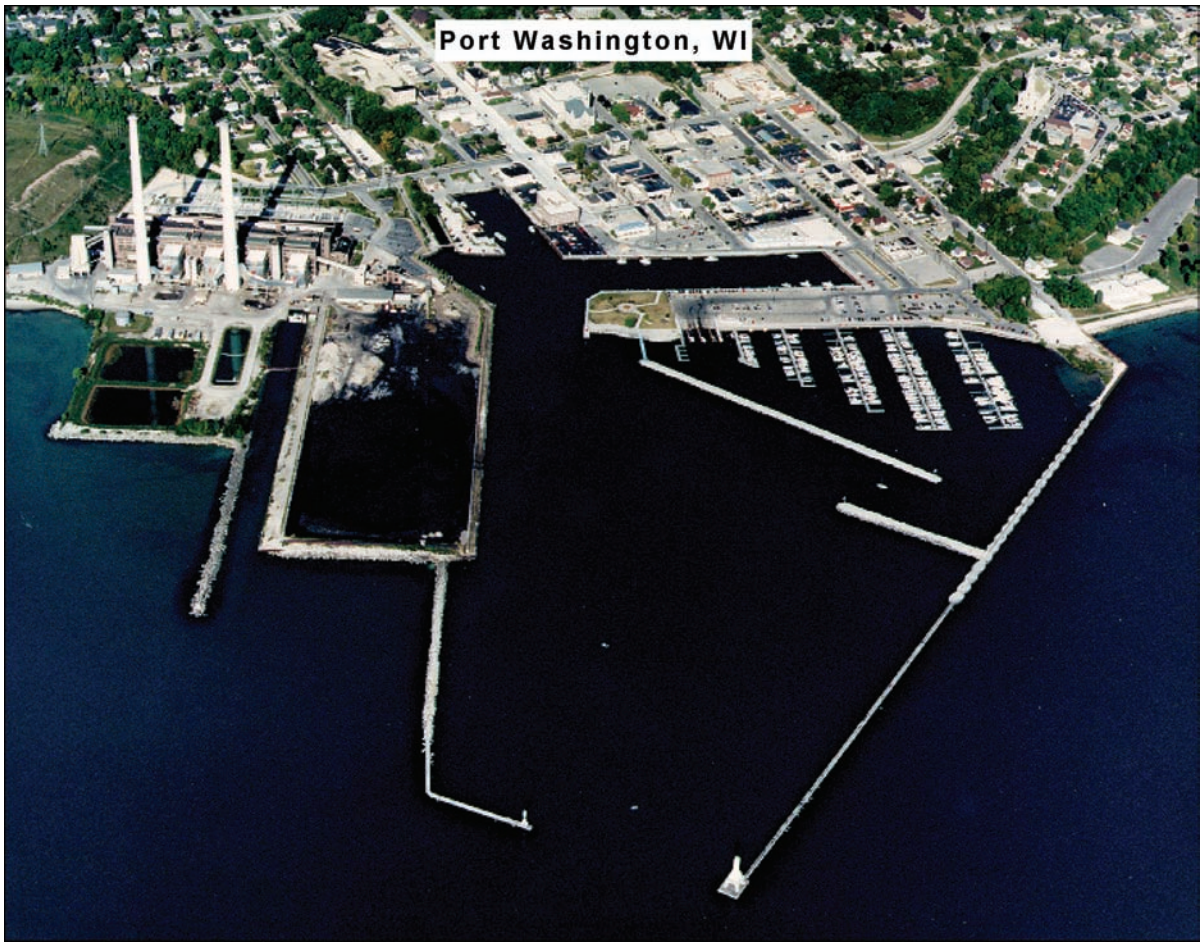
Small-craft facilities

(739) S of the outer harbor, a series of breakwaters parallels the SW shore of Milwaukee Bay for about 2 miles. The basin thus formed provides good anchorage for small-craft, and gasoline and diesel fuel are available at the yacht club at the N end. The basin may be entered from the S end of the outer harbor, marked by a light, or through a breakwater gap marked by a lighted buoy about 0.7 mile S of the outer harbor. The open S end of the basin and the small breakwater gap 0.45 mile NW should not be used without local knowledge.

(740) The municipal marina at the N end of the outer harbor provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and launching ramps. A marina on the W side of the mouth of Kinnickinnic River provides gasoline, diesel fuel, sewage pump-out, and marine supplies. A 60-ton stiff-leg crane is available for complete hull and engine repairs. A repair yard on the E side of Kinnickinnic River 1.1 miles above the mouth has a 20-ton hoist and makes hull and small engine repairs. A detached crescent-shaped breakwater, marked at each end by a private daybeacon, is 300 feet N of Pier Wisconsin in the N part of the outer harbor.

Ferries

(741) A ferry which carries passengers and/or vehicles operates between Milwaukee and Muskegon, MI from a terminal near the Coast Guard Base at the S end of the outer harbor.



Communications

(742) Milwaukee has excellent highway and rail freight connections. General Mitchell Field at the S end of the city provides freight and passenger air service.

(743) **North Point,** about 3 miles N of the entrance to Milwaukee Harbor, is the N point of Milwaukee Bay. **North Point Light** (43°03.9'N., 87°52.3'W.), 154 feet above the water, is shown from a white octagonal tower with a red roof on the point.

Caution

(744) A small arms firing range is on the lakefront about 1,800 feet NE of North Point Light. Daily firing creates a caution zone extending 1,200 feet SE into Lake Michigan. The zone is 1,200 feet wide at its outer end and 500 feet wide at the shoreline. Guards are posted to signal cease firing when necessary, but mariners are advised to consult Local Notices to Mariners for schedules of firing and instructions.

Chart 14904

(745) **Whitefish Bay** is a slight recession in the shoreline between North Point and **Fox Point,** 6.5 miles N. The shoal border around the bay is about 0.7 mile wide. Submerged net stakes extend about 0.9 mile from shore.

(746) From Fox Point N for 15 miles to Port Washington, the shore is a steep bluff about 100 feet high. Shoals extend 0.5 to 1 mile offshore. A wreck, covered 1 foot, is 0.6 mile offshore 3.3 miles N of Fox Point. A bell tower, reported to resemble a spire, is prominent about 6 miles N of Fox Point.

(747) **Port Washington, Wis.,** is an artificial harbor about 25 miles N of Milwaukee Harbor. **Sauk Creek,** a very small stream, enters the S side of the harbor at the inner end of the coal wharf.

Prominent features

(748) Prominent are the powerplant stacks on the S side of the harbor and spires NW of the inner end of the N breakwater.

(749) **Port Washington Breakwater Light** (43°23'10"N., 87°51'35"W.), 78 feet above the water, is shown from a

square tower on the outer end of the N breakwater; a fog signal is at the light.

Channels

(750) A dredged entrance channel leads from deep water in Lake Michigan to an outer basin protected on the N by a breakwater and on the S by a breakwater and coal wharf. The outer ends of the breakwaters are marked by lights and the NE corner of the coal wharf is marked by a private light. From the W end of the outer basin, the channel leads to two inner basins. In August 2005, the controlling depth was 21 feet in the entrance channel, thence depths of 14 to 18 feet were available in the basin; thence in 1999, 10.7 feet in the W basin; thence in 1996, 15 feet in the N basin.

(751) The intake channel of the Wisconsin Electric Power Co. is 1,200 feet SW of the harbor entrance. The S side of the channel is protected by a jetty, marked on the outer end by a private light. An overhead power cable with unknown clearance crosses the mouth of the channel.

Caution

(752) Power company cooling water is discharged into the harbor in the vicinity of Sauk Creek and creates a very dangerous current across the entrance to the W inner basin. Extreme caution should be exercised when maneuvering in this vicinity. With 30 minutes advance notice of vessel arrival in the harbor, the Wisconsin Electric Power Co. will reduce cooling water discharge at the request of the vessel master and will make arrangements to handle lines when entering or leaving harbor. The power company can be contacted via the marine operator or by telephone, 414–284–5161, 24 hours a day.

(753) In April 1983, a dangerous wreck was reported about 0.4 mile, **335°** from Port Washington Breakwater Light in 43°23'27.4"N., 87°51'46.6"W.

Harbor regulations

(754) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(755) **Wharves-Wisconsin Electric Power Co., Port Washington Plant Coal Dock:** S side of Port Washington Harbor; 1,000-foot face, 21 to 30 feet alongside; deck height, 10 feet; 40-inch electric belt conveyor, rate 500 tons per hour; open storage for 500,000 tons of coal; receipt of coal; owned and operated by Wisconsin Electric Power Co.

Small-craft facilities

(756) A small-craft basin, protected by breakwaters, is in the NW corner of the outer basin. The outer ends of the breakwaters are marked by lights. A dredged entrance channel leads into the basin and along the ends of the piers to a launching ramp on the W side of the basin. In August 2005, the controlling depth was 4 feet in the entrance channel to the launching ramp. Transient berths, gasoline, water, and electricity are available on the N side of the W inner basin and a sewage pump-out facility is in the N inner basin.

Charts 14904, 14903

(757) From Port Washington for about 26 miles NNE to Sheboygan, the shore is bold. Shoals extend about 0.6 mile offshore, and numerous net stakes are within 2 miles of shore. A wreck, covered 26 feet, is 0.9 mile from shore 8.2 miles NNE of Port Washington. A sunken caisson, covered 16 feet, is 0.6 mile offshore 8 miles SSW of Sheboygan. Tanks at Belgium, Cedar Grove, and Oostburg, Wis., are prominent.

Charts 14903, 14922

(758) **Sheboygan, Wis.**, is a port city about 51 miles N of Milwaukee Harbor at the mouth of the **Sheboygan River.**

(759) **Sheboygan Breakwater Light** (43°45.0'N., 87°41.5'W.), 55 feet above the water, is shown from a cylindrical tower on the outer end of the breakwater on the N side of the entrance channel; a fog signal is at the light.

Caution

(760) A Sheboygan Police Department firing zone is about 2 miles S of the S pier at Sheboygan Harbor. The firing area is 3,500 feet wide and extends about 3 miles lakeward. Firing is conducted from 0600 to 2100 7 days a week, year round; red flags are displayed while firing is in progress. Extreme caution is advised.

Channels

(761) A dredged entrance channel leads NW from deep water in Lake Michigan between a breakwater on the N and a pier on the S to an outer harbor turning basin. The outer ends of the breakwater and pier are marked by lights. The channel leads across the S side of the basin to the mouth of Sheboygan River and thence upstream for about 1 mile. The N side of the river mouth is marked by a light.

(762) In June 2005, the controlling depths were 14.2 feet in the entrance channel and through the S side of the basin to the mouth of the river (except for shoaling to 2 feet in the left half of the channel between the river mouth and the South Pierhead Light); the N side of the

basin had depths of 19 feet at the E end, gradually decreasing to 14 feet at the W end. From the river mouth, the river channel had a controlling depth of 6.9 feet (except for shoaling to 1.5 feet in the left outside quarter of the channel at the mouth), thence 2.8 feet (3.6 feet at midchannel) to the head of the project.

(763) The entrance channel is subject to shoaling caused by the drift of sand from the S.

(764) Currents in the river attain velocities up to 3 mph.

(765) The outer basin is not adapted for anchorage, but greatly reduces wave action in the lower river. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

Bridge regulations

(766) All watercraft navigating the Sheboygan River and harbor or other navigable waters connected herewith within the limits of the city of Sheboygan, when passing any bridge in said city, shall move or be moved past the same as expeditiously as is consistent with the proper use of the river by other watercraft; but in no case shall any watercraft, while passing through any bridge, remain or obstruct the passageway more than 5 minutes, and no watercraft shall be so anchored or fastened as to prevent any bridge from a free and speedy opening. Any master or other person having charge of any watercraft, who shall violate any provisions in this section, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $25.

(767) **Time allowed for opening bridge.**–Whenever any person having charge of any watercraft shall wish to move the same past any bridge, reasonable time shall be allowed for the opening of the same; and any person who shall move any watercraft against any bridge, or the center or protection pier thereof, before the same shall be opened, to the injury thereof, shall forfeit and pay for each offense a penalty of not less than $5 nor more than $50, and shall likewise be liable to the city of Sheboygan for all damages done to the bridge and center or protection piers thereof.

Towage

(768) Tugs are available from Milwaukee and Sturgeon Bay. (See Towage under those ports.)

(769) Sheboygan is a **customs port of entry.**

Structures across Sheboygan River
Miles above North Pierhead Light
****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
1	S. Eighth St. bridge	Highway	0.69			75	14	Bascule. Note 1.
2	Overhead cable		0.77					Data not available.
3	Overhead cable	Power	0.87				141	
4	Pennsylvania Ave. bridge	Highway	1.14			38	19	Fixed.
5	Overhead cable		1.22					Note 2.
6	Overhead cable		1.56					Data not available.
7	Chicago & North Western Ry. bridge	Railroad	1.57	60	60		20	Fixed.
8	Fourteenth St. bridge	Highway	1.65			54	14	Fixed.
9	Chicago & North Western Ry. bridge	Railroad	2.29					Fixed. Data not available.
10	Overhead cable		2.30					Data not available.
11	Overhead cable		2.35					Data not available.
12	New Jersey Ave. bridge	Highway	2.36					Fixed. Data not available.

Note 1.–**See 33 CFR 117.1 through 117.59 and 117.1097**, chapter 2, for drawbridge regulations.

Note 2.–Cable extends from W side of the river to an island at midchannel.

Coast Guard

(770) **Sheboygan Coast Guard Station** is on the N side of the mouth of Sheboygan River.

Harbor regulations

(771) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(772) Local harbor regulations are enforced by the **harbormaster** who can be reached through the Department of Public Works, City Hall, Sheboygan, Wis. 53081. A **speed limit** of 4 mph (3.5 knots) is enforced within the harbor limits. Copies of the regulations may be obtained from the harbormaster.

Small-craft facilities

(773) Marinas on the Sheboygan River and in the outer harbor basin can provide transient berths, gasoline, diesel fuel, water, ice, launching ramp, electricity, sewage pump-out, and limited marine supplies. Hoists can handle 35-foot boats for engine and minor hull repairs.

(774) From Sheboygan, the shore is a moderate bluff for 24 miles NNE to Manitowoc. The shoal border in this stretch is up to 1.4 miles wide and has scattered rocks and boulders covered 8 to 12 feet near the outer edge. **Sheboygan Reef,** with depths of 4 to 18 feet and marked on the E side by a buoy, is 0.6 mile N of Sheboygan Breakwater Light. A dangerous boulder, covered 2 feet, is 0.7 mile offshore 9.6 miles N of Sheboygan. A dangerous submerged rock is 1 mile offshore at the village of Northeim, Wis., 17 miles N of Sheboygan.

Chart 14903

Caution

(775) The Sheboygan Rifle and Pistol Club, Inc., conducts firing daily on the lakefront about 5.5 miles N of the entrance to Sheboygan harbor. This firing creates a caution zone about 3,500 feet wide extending 3 miles lakeward from the shoreline. Mariners are advised to consult Local Notices to Mariners for schedules of firing and instructions.

Structures across Manitowoc River
***Miles above the mouth of the river**
****Clear width in feet proceeding upstream**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
1	Eighth St. bridge	Highway	0.29			120	12	Bascule. Note 1.
2	Tenth St. bridge	Highway	0.43			120	14	Bascule. Note 1.
3	Canadian National RR bridge	Railroad	0.91			93	6	Bascule. Notes 1 and 2.
4	Canadian National RR bridge	Railroad	1.60	61	61		6	Hand-operated Swing. Seldom opened.
5	Chicago & North Western Ry. bridge	Railroad	1.75	60	60		11	Fixed.
6	Overhead cable	Power	1.76				84	
7	Overhead cable	Power	1.86				64	
8	Overhead cables	Power	1.95				84	
9	Twenty-first St. bridge	Highway	1.97			107	16	Fixed.
10	Overhead cables		2.02					Data not available.
11	Overhead cable		2.30					Data not available.
12	Canadian National RR bridge	Railroad	2.33	45	45		11	Fixed. Head of navigation.

Note 1.–See **33 CFR 117.1 through 117.59 and 117.1089**, chapter 2, for drawbridge regulations.

Note 2.–No bridgetender is on duty on Saturdays or Sundays and from 2000 to 0400 on weekdays from about December 15 to March 15 annually. Bridge will be opened on 2-hour advance notice; from 0630 or 1530 telephone the telegraph operator, 648-6861, and at all other times call the Soo Line section foreman, 414-722-4228.

(776) **Cleveland, Wis.,** formerly **Hika,** is 11.5 miles N of Sheboygan. In 1978, only a natural ramp and a small pier with shallow water alongside were available for boats at Cleveland.

(777) Pilings that bare are about 275 yards offshore in about 43°59.6'N., 87°41.5'W. Caution should be exercised in the area.

Charts 14903, 14922

(778) **Manitowoc, Wis.**, is a port city at the mouth of **Manitowoc River,** about 75 miles N of Milwaukee Harbor. The most prominent feature at Manitowoc is the lighted elevator 0.6 mile SW of Manitowoc Breakwater Light. The lighted stack 0.5 mile S of the elevator has horizontal red and white bands.

(779) **Manitowoc Breakwater Light** (44°05.6'N., 87°38.6'W.), 52 feet above the water, is shown from a cylindrical tower on a fog signal building on the outer end of the N breakwater; a fog signal is at the light.

Channels

(780) A dredged entrance channel leads from deep water in Lake Michigan between converging breakwaters through Manitowoc Harbor to the mouth of the Manitowoc River, and thence upstream for about 1.7 miles to a point about 200 feet below the Chicago & North Western Railway bridge. The outer ends of the breakwaters and the N side of the river mouth are marked by lights. In August 2006, the controlling depths were 15.1 feet (19.4 feet at midchannel) in the entrance, through the harbor, and in the river channel to the first railroad bridge about 0.9 mile above the mouth (except for shoaling to 13 feet along the S edge of the channel in the harbor and gradual shoaling to 10 feet in the NW corner of the harbor), thence 13.3 feet to the second railroad bridge about 1.6 miles above the mouth, thence 8.3 feet to the head of the project.

(781) A small-boat basin, entered through an opening in the N breakwater, is about 0.25 mile above Manitowoc Breakwater Light. The E side of the entrance is protected by a short jetty, marked at its outer end by a light. The ends of the breakwater are marked by a light and a daybeacon. In August 2006, the

controlling depth was 9.7 feet with lesser depths to 8 feet along the edges of the entrance channel, thence depths of 8 to 10 feet were available in the basin and channel E of the docking piers.

(782) The river channel is quite winding and should be navigated with care. The river banks are generally hardpan and firm clay, quite stony in places.

(783) Above the dredged channel, the river has depths of 6 feet in the NW half and 10 feet in the SE half to the Chicago and North Western Railway bridge except for a 5-foot shoal extending downstream from the center bridge pier, thence about 4 feet to the Twenty-first Street bridge, and thence about 3 feet to the third Canadian National Railroad bridge.

(784) Manitowoc Harbor is not adapted for anchorage, but reduces wave action in the lower section of the river. Mooring to the breakwaters is prohibited. Mariners are cautioned against navigating outside the channel limits in the vicinity of structures protected by stone riprap.

(785) The currents in the river attain velocities up to 3 mph.

(786) An irregularly shaped diked disposal area extends 1,700 feet N from the N side of the N breakwater.

Caution

(787) **Manitowoc Shoal**, on the S side of the approach to the harbor, has a least depth of 14 feet about 0.65 mile SE of Manitowoc Breakwater Light. The NE side of the shoal area is marked by a buoy. A shoal with a least depth of 14 feet is about 1.2 miles SE of the breakwater light.

Towage

(788) Tugs are available from Milwaukee, Sturgeon Bay, and Green Bay. (See Towage under those ports.)

(789) Manitowoc is a **customs port of entry.**

Harbor regulations

(790) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(791) Local harbor regulations are under the control of the Harbor Commission and are enforced by the **harbormaster** who can be reached through the Board of Harbor Commissioners, City Hall, 817 Franklin Street, Manitowoc, Wis. 54220. Copies of the regulations can be obtained from the Board of Harbor Commissioners. A **speed limit** of 4 mph (3.5 knots) is enforced within the harbor limits.

Wharves

(792) Manitowoc has several deep-draft facilities along the Manitowoc River. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) The facilities described have highway connections and some have railway connections. Some of the facilities have water and electrical shore-power connections.

(793) **C. Reiss Coal Co. Dock:** W side of the slip extending S at the river mouth; 900-foot face; 17 to 23 feet alongside; deck height, 8 feet; open storage for 175,000 tons of coal; receipt of coal; owned and operated by C. Reiss Coal Co.

(794) **Anheuser-Busch, Grain Dock:** S side of the river 700 feet above the mouth; 190-foot face; 19 feet alongside; deck heights, 4 and 6 feet; silo storage for over 4 million bushels of grain; one marine leg, unloading rate 9,500 bushels per hour; one vessel-loading spout, loading rate 12,500 bushels per hour; receipt of grain; owned and operated by Anheuser-Busch, Inc.

(795) **The Manitowoc Co., Berths A and B:** W side of the river 0.15 mile above the first Soo Line Railroad bridge; Berth A, 450-foot face, 21 feet alongside; Berth B, 680-foot face, 16 to 18 feet alongside; deck height, 3½ feet; shipment of heavy machinery; owned and operated by The Manitowoc Co., Inc.

(796) **The Manitowoc Co., Berths C and D:** W side of the river 0.3 mile above the first Soo Line Railroad bridge; Berth C, 260-foot face, 14 to 16 feet alongside; Berth D, 360-foot face, 14 to 16 feet alongside; deck height, 3½ feet; 75-ton stiff-leg derrick; shipment of heavy-lift items; owned and operated by The Manitowoc Co., Inc.

(797) **CEMEX Terminal:** NW side of the river at the upper end of the dredged channel; 1,200-foot face; 20 feet alongside; deck height, 6 feet; silo storage for 53,000 tons of cement; receipt of bulk cement; owned and operated by Medusa Cement Co.

Small-craft facilities

(798) Transient berths, electricity, water, ice, gasoline, diesel fuel, marine railway with lift capacity of 35 tons for vessels up to 70 feet for hull and engine repairs, sewage pump-out facilities, and a launching ramp are available on the N side of the river mouth.

Ferries

(799) Ferry service is available for passengers and autos to Ludington, Mich. The ferry operates from the E side of the slip at the river mouth from about mid May to October.

Structures across East and West Twin Rivers
***Miles above North Pierhead Light**
****Clear width in feet proceeding upstream**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	East Twin River							
1	17th St. bridge	Highway	0.48			70	14	Bascule.
2	22nd St. bridge	Highway	0.82			70	9	Bascule.
3	Overhead cable		1.00				38	
	West Twin River							
4	Washington St. bridge	Highway	0.53			53	15	Fixed.
5	Chicago & North Western Ry. bridge	Railroad	0.62	50	50		12	Swing.
6	Overhead cables	Power	0.62				95	
7	16th and Madison Sts. bridge	Highway	0.81			70	14	Bascule.
8	Overhead cable		0.91				37	

Supplies and repairs

(800) Large vessels do not normally bunker or take on supplies at Manitowoc. Bunker oil can be supplied by tank truck. Emergency above-the-waterline repairs are available.

Chart 14903

(801) The shore trends 5.7 miles NE from Manitowoc to Two Rivers. A shoal with a least depth of 8 feet and marked on the SE side by a buoy is 1 mile NE of Manitowoc Breakwater Light. Otherwise, the 18-foot contour is within 0.5 mile of shore in this stretch. Net stakes extend about 1.5 miles from shore.

(802) **Two Rivers, Wis.,** is a town and harbor at the mouth of the **Twin Rivers,** about 80 miles N of Milwaukee Harbor. The harbor is used mainly by local fish tugs and recreational craft.

Prominent features

(803) Prominent is a spire, 0.5 mile NNW of the harbor entrance, and a lighted blue tank with "Twin Rivers" in black letters 0.9 mile NNE of the harbor entrance.

Channels

(804) A dredged entrance channel leads NW from deep water in Lake Michigan between parallel piers to a harbor basin at the confluence of **East Twin River** and **West Twin River** and thence upstream in East Twin River for about 0.5 mile to the 22nd Street bridge. The outer ends of the piers are marked by lights. In June 2006, the controlling depths were 8.9 feet in the entrance and between the piers to the basin, thence depths of 8.4 to 13 feet were available in the basin, thence 3.1 feet to the head of the project at the 22nd Street bridge. The entrance channel is subject to shoaling, especially during the winter and after severe storms.

(805) A small basin at the shoreward end of the N pier is not used by vessels, but reduces wave action in the inner harbor. The inner basin is not adapted for anchorage, and mooring to the piers and revetments is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(806) Currents in the river attain velocities up to 3 mph.

(807) West Twin River has depths of about 9 feet in the S part of the channel from the basin to Washington Street bridge. The nominal head of navigation on the East and West Twin Rivers is 3 and 7 miles, respectively, from the mouth, the navigable depth being not over 4 feet. Only small recreational craft operate on these rivers above the dredged channels.

Bridge regulations

(808) (a) Notice to Open Bridges Required. The operator of any boat desiring to pass through any bridge in the city of Two Rivers shall notify the city of his intention to pass through such bridge, and the city employees shall be allowed a reasonable time thereafter to open such bridge.

(809) (b) Bridges on West Twin River. To avoid traffic congestion, the bridges on the West Twin River shall not be opened between 6:30 a.m. and 7:00 a.m., 7:30 a.m. and 8:00 a.m., 11:55 a.m. and 1:00 p.m., 3:30 p.m. and 4:15 p.m. and 4:45 and 5:15 p.m. on any day except Saturday, Sunday, and holidays when they may be opened at anytime.

(810) Request to open bridges should be given to the Two Rivers Police Department, telephone 414-793-1155, via land telephone or marine operator.

Coast Guard

(811) **Two Rivers Coast Guard Station** is on the NE side of the entrance channel.

Harbor regulations

(812) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Small-craft facilities

(813) A marina on the S side of the West Twin River provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and a launching ramp. A 40-ton crane is available for engine and electronic repairs.

(814) **Rawley Point** is a broad, rounding, wooded point NE of Two Rivers. **Rawley Point Light** (44°12.7'N., 87°30.5'W.), 113 feet above the water, is shown from a white cylindrical tower on the point, 5.3 miles NE of Two Rivers. Between Two Rivers and Rawley Point Light, shoals extend about 0.8 mile from shore. Net stakes reach over 2 miles from shore.

(815) From Rawley Point Light the moderately bluff shore trends generally N for about 17 miles to Kewaunee. Rocky shallows extend about 1 mile from shore. A dangerous wreck that bares is about 1.5 miles north of Rawley Point Light in about 44°13.9'N., 87°30.2'W. Extreme caution should be exercised in the area. Point Beach Nuclear Power Plant, 5 miles N of Rawley Point Light, has a square green building prominent from offshore. Kewaunee Nuclear Power Plant is on **Observation Point,** 9 miles N of Rawley Point Light. The cooling tower at the plant is prominent.

(816) **Security zones** have been established in the waters off the Point Beach Nuclear Power Plant and Kewaunee Nuclear Power Plant, between Rawley Point and Kewaunee. (See **33 CFR 165.1 through 165.8, 165.30 through 165.33, and 165.916**, chapter 2 for limits and regulations.)

(817) **Kewaunee Shoal** is a hard gravel and boulder reef extending about 1.8 miles E from shore just S of the entrance to Kewaunee harbor. The shoal has a least depth of 13 feet near the outer end. **Kewaunee Shoal Light** (44°27.1'N., 87°27.9'W.), 43 feet above the water, is shown from a white cylindrical tower with green band on the outer end of the shoal; a fog signal is at the light. Due to protective riprap, the light should not be passed close aboard, even by shallow-draft vessels.

Charts 14902, 14903, 14910

(818) **Kewaunee, Wis.**, is a town and small-craft harbor at the mouth of **Kewaunee River,** about 102 miles N of Milwaukee Harbor and 25 miles S of the entrance to the Sturgeon Bay Ship Canal.

(819) **Kewaunee Pierhead Light** (44°27.5'N., 87°29.8'W.), 45 feet above the water, is shown from a white square tower on the outer end of the pier on the S side of the harbor entrance; a fog signal is at the light.

Channels

(820) A dredged entrance channel leads from deep water in Lake Michigan NW to an outer harbor basin protected by a breakwater on the NE side and a pier on the S side. The outer ends of the breakwater and pier are marked by lights. From the outer basin, the channel leads between piers at the mouth of Kewaunee River to a turning basin inside the mouth, thence N inside the shoreline to the N harbor basin. The outer end of the pier on the N side of the river mouth is marked by a light.

(821) In 2003-November 2005, the controlling depths were 15.3 feet in the approach to the outer harbor basin, thence 11 to 13 feet in the S part of the outer basin along the S pier and 8 to 10 feet in the W part with gradual shoaling to 3 feet along the W edge, thence 16.1 feet to the N harbor basin with lesser depths to 13 feet along the edges of the channel, thence 18 to 20 feet was available in the basin.

(822) The outer basin is not adapted for anchorage, but reduces wave action in the inner harbor. Mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(823) Currents in the river attain velocities up to 3 mph.

(824) Above the turning basin, the Kewaunee River is navigable for about 6.5 miles by craft drawing not more than 4 feet.

Caution

(825) Kewaunee Shoal and a shoal with a least depth of 15 feet that extends 0.5 mile E from the outer end of the breakwater should be avoided in approaching the harbor.

Bridges

(826) A fixed bridge with a reported clearance of 16 feet crosses Kewaunee River about 0.3 mile above the mouth. Overhead power cables just below the bridge and 0.2 mile above the bridge have clearances of 46 and 28 feet, respectively.

Harbor regulations

(827) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

(828) Local harbor regulations have been established by the city of Kewaunee and are enforced by a **harbormaster,** usually found at the city launch ramps, and by the police department. A **speed limit** of 5 mph (4.3 knots) is enforced in the harbor. Copies of regulations can be had from the City Clerk, 413 Milwaukee Street, Kewaunee, Wis. 54216.

Small-craft facilities

(829) A municipal marina is about 0.1 mile upstream from the turning basin. Transient berths, electricity, gasoline, sewage pump-out, water, ice, and launching ramp located close W of the facility are available. Another marina, on the N side of the N harbor basin, provides transient berths, electricity, gasoline, diesel fuel, sewage pump-out, water, ice, launching ramp, hull and engine repair, marine supplies, and a 35-ton lift.

(830) From Kewaunee N for 11 miles to Algoma the shore is low bluffs decreasing in height at the N end of the reach. Shoals extend about 0.8 mile offshore. Boulders covered 11 to 12 feet are near the outer edge of the bank just N of Kewaunee. Detached 11- and 12-foot spots are from 0.2 to 0.5 mile S of the entrance to Algoma harbor.

(831) **Algoma, Wis.,** is a town and small-craft harbor at the mouth of the **Ahnapee River,** about 112 miles N of Milwaukee Harbor and 14 miles SSW of the entrance to the Sturgeon Bay Ship Canal. The harbor is used mainly by local fish tugs and recreational craft.

Prominent features

(832) Two black stacks are 0.9 mile NW of the entrance and a gray spire is 0.4 mile N of the entrance.

(833) **Algoma Light** (44°36.4'N., 87°25.8'W.), 48 feet above the water, is shown from a cylindrical tower on the outer end of the pier on the N side of the entrance channel; a fog signal is at the light.

Channels

(834) A dredged entrance channel leads from deep water in Lake Michigan between a N pier with a detached outer section and a S breakwater to an outer harbor basin, thence through the mouth of Ahnapee River upstream for 0.2 mile to the Second Street bridge. The outer ends of the breakwater, the detached pier, and the main outer sections are marked by lights. In June 2005, the controlling depths were 9.1 feet in the entrance between the pier and breakwater to the basin, thence 4.8 feet through the mouth of the river to the Second Street bridge (except for lesser depths to 2.9 feet along the SW edge of the channel 300 feet below the bridge.) In 1985, the outer basin, SW of the channel, had depths of 7 feet decreasing to 2½ feet at the SW limit.

(835) The river channel bottom is rock and should be navigated with caution. Above the dredged channel, depths of about 3 feet can be carried for about 2 miles. The bottom in this reach is also rock.

(836) The outer basin is not adapted for anchorage, and mooring to the breakwater or piers is prohibited. Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(837) Currents in the river attain velocities up to 3 mph.

Bridges

(838) Second Street bridge, about 0.2 mile above the mouth of Ahnapee River, has a fixed span with a clearance of 11 feet. Fourth Street bridge, 0.4 mile above the river mouth, has a 42-foot fixed span with a clearance of 11 feet. Overhead cables just below and about 0.2 mile above the Fourth Street bridge have unknown clearances. An overhead power cable about 300 feet above the bridge has a clearance of 39 feet.

Harbor regulations

(839) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.) Local harbor regulations have been established by the city of Algoma, and are enforced by a Water Safety Patrol. Copies of regulations may be obtained from the Chief of the Water Safety Patrol.

Small-craft facilities

(840) A marina on the NE side of the river just above the mouth provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and marine supplies. Hoists to 40 tons are available for complete hull, engine, and electronic repairs. In 1978, the reported controlling depth was 8 feet alongside the fuel dock.

(841) From Algoma NNE for 14 miles to the entrance to the Sturgeon Bay Ship Canal, the shore is wooded and hilly, becoming lower in the N 4 miles. The shoal border varies in width from 0.5 to 1.3 miles. A buoy 2.2

miles S of the canal entrance marks the outer edge of the shoals.

Charts 14902, 14910, 14919

(842) **Sturgeon Bay Ship Canal** provides a navigable connection between Lake Michigan and the S end of Green Bay. A canal has been cut from Lake Michigan across a narrow strip of land to the head of **Sturgeon Bay,** and thence a dredged channel leads through Sturgeon Bay to Green Bay. The Lake Michigan entrance to the canal is about 126 miles N of Milwaukee Harbor, across the lake W of Frankfort, Mich.

(843) **Sturgeon Bay Ship Canal Light** (44°47.7'N., 87°18.8'W.), 107 feet above the water, is shown from a white cylindrical tower on the N side of the canal entrance.

Channels

(844) The dredged channel from Lake Michigan to Green Bay is about 8.6 miles long. The channel leads NW from deep water in Lake Michigan through detached piers and converging breakwaters, thence through a revetted canal to the SE end of Sturgeon Bay and thence through Sturgeon Bay to the vicinity of Sherwood Point. A turning basin is on the SW side of the channel at the city of Sturgeon Bay. The outer ends of the piers are marked by lights, and the approach channel is marked by unlighted buoys 0.2 mile SE of the pierhead lights. A fog signal is at the N pierhead light. The dredged channels through the canal and Sturgeon Bay are well marked with lights, a lighted range, and lighted and unlighted buoys.

(845) In May-June 2006, the controlling depths were 14.9 feet (18.3 feet at midchannel) in the entrance and between the breakwaters to Light 6 at the mouth of the canal, thence 22 feet through the canal to Light 7 (except for lesser depths to 19 feet along the SW edge of the channel), thence 12.1 feet (17 feet at midchannel) to the Bay View (State Route 42/57) bascule bridge, thence 16.1 feet (19.8 feet at midchannel) through Sturgeon Bay to Green Bay; the turning basin had depths of 18 to 20 feet.

(846) Currents in the canal and bay attain velocities up to 7 mph in either direction.

(847) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(848) The channels and basin are not adapted for anchorage of vessels; vessels entering the canal for shelter may moor at the W end of same.

(849) Sturgeon Bay is a natural branch of Green Bay, but the navigational aids that mark the channel through it are placed with respect to proceeding from Lake Michigan through the ship canal to Green Bay.

Dangers

(850) A shoal with a least depth of 16 feet is 1.3 miles SE of the Lake Michigan entrance to the canal. A lighted buoy at the S end of the shoal marks the approach to the canal.

(851) A solid rock ledge, covered 10 feet, borders the SW side of the dredged approach channel. Vessels entering the canal should avoid courses which will carry them close to this ledge and should enter the dredged approach channel between the unlighted buoys at its outer end.

Bridges

(852) An overhead power cable with a clearance of 140 feet crosses the canal 1.25 miles above the Lake Michigan entrance. Bay View (State Routes 42/57) bascule highway bridge, with a clearance of 42 feet, crosses the canal 3 miles above the entrance. Michigan Street bridge at Sturgeon Bay has a bascule span with a clearance of 14 feet. (See **33 CFR 117.1 through 117.59 and 117.1101,** chapter 2, for drawbridge regulations.)

Coast Guard

(853) **Sturgeon Bay Canal Coast Guard Station** is on the N side of the Lake Michigan entrance.

(854) A **speed limit** of 5 mph (4.3 knots) is enforced in the Sturgeon Bay Ship Canal. (See **33 CFR 162.125 and 207.470,** chapter 2, for navigation regulations.)

(855) **Sturgeon Bay, Wis.**, is a city on the Sturgeon Bay Ship Canal midway between Lake Michigan and Green Bay. The city is an important repair center, having facilities for repairs to all types and sizes of craft.

Anchorages

(856) Special anchorages are on the N side of the dredged channel at the Bayview Bridge and on the S side of the channel 0.8 mile W of the bridge. (See **33 CFR 110.1 and 110.78,** chapter 2, for limits and regulations.)

Towage

(857) Tugs to 2,000 hp are available at Sturgeon Bay from Selvick Marine Towing Corporation. Arrangements are made through their dispatch office in Sturgeon Bay at 920-743-6016. Tugs are also available from Green Bay. (See Towage under Green Bay.) The tugs monitor VHF-FM channel 16.

(858) The Coast Guard maintains a **Marine Safety Detachment** office at Sturgeon Bay. (See Appendix A for address.)

Repairs

(859) Bay Shipbuilding Corp. operates two graving docks and a floating drydock on the E side of Sturgeon Bay 0.7 mile N of the Michigan Street bridge. The largest graving dock is 1,150 feet long, 140 feet wide, and has 18 feet over the keel blocks. The floating drydock can handle vessels to 640 feet long, 68 feet wide, and 7,150 tons. The 604-foot drydock is sectional and can be split up to any combination of 60-foot lengths.

Small-craft facilities

(860) There are several marinas on both the NE and SW sides of Sturgeon Bay between the two bridges. The marinas can provide: transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, marine supplies, and launching ramps. Mobile hoists to 50 tons are available for complete hull, engine, and electronic repairs. Reported depths alongside the docks were 3 to 13 feet.

(861) Just NW of the Michigan Street bridge, a narrow spit of land, the remains of a former railroad bridge, extends NE from shore to near the edge of the dredged channel. A buoy off the end of the spit marks the channel limit.

(862) **Dunlap Reef,** marked on the NE side by a light, is on the W side of the dredged channel from about 0.3 to 0.7 mile NW of the Michigan Street bridge. The center of the reef bares. A buoy midlength of the E side of the reef marks the edge of the dredged channel. There is deep water to W of the reef, but only about 11 feet between the S end of the reef and the spit of land NW of the Michigan Street bridge.

(863) **Hills Point,** marked by a light, is on the W side of Sturgeon Bay 2.2 miles NW of the Michigan Street bridge. **Sturgeon Bay Entrance Leading Light,** on shore 0.8 mile NW of Hills Point, shows on the centerline of the entrance channel to Sturgeon Bay from Green Bay.

(864) **Sawyer Harbor** is a small shallow inlet on the W side just inside the mouth of Sturgeon Bay. A marina on the N side of the inlet provides transient berths, water, and electricity.

(865) **Sherwood Point** is the N point of the spit of land that extends N and E from shore to form the W side of the entrance to Sturgeon Bay. **Sherwood Point Light** (44°53.6'N., 87°26.0'W.), 61 feet above the water, is shown from a white square tower with an attached dwelling on the point. A lighted bell buoy 1 mile E of Sherwood Point Light, near the middle of the mouth of Sturgeon Bay, marks the entrance to the Sturgeon Bay Ship Canal.

(866) **Sherwood Point Shoal,** a detached shoal with a least depth of 11 feet, is marked on the N side by a lighted horn buoy 2 miles NW of Sherwood Point Light. The shoal is a hazard to vessels approaching Sturgeon Bay from S. A shoal bank with depths of 2 to 18 feet extends from shore SW of Sherwood Point to within 0.3 mile of the S side of Sherwood Point Shoal.

Chart 14902

(867) From the SE entrance to the Sturgeon Bay Ship Canal, the W shore of Lake Michigan trends NNE for 38 miles to the N tip of Door Peninsula, which separates the S end of Green Bay from Lake Michigan. This stretch is composed of a series of points with small bays between. The offshore areas are interspersed with submerged net stakes. The shore is low, sloping, and wooded.

Charts 14902, 14910

(868) **Whitefish Point** (44°52.5'N., 87°12.3'W.) is 7.7 miles NE of Sturgeon Bay Canal Light. A shoal with a least depth of 10 feet, marked at the outer end by a buoy, extends 1 mile SE from the point.

(869) **Whitefish Bay** is a bight between Whitefish Point and **Cave Point,** 4 miles NNE. From the Sturgeon Bay Ship Canal NNE to Cave Point, the shoal border varies in width from 0.3 to 1 mile. A detached rock ledge, covered 16 feet, is off the mouth of Whitefish Bay, 1.8 miles S of Cave Point.

(870) **Jacksonport, Wis.,** a small village 3.4 miles N of Cave Point, is used by only a few recreational craft. There is a launching ramp at the State park.

(871) A shoal with a least depth of 3 feet extends 1.8 miles SE from shore just N of Jacksonport and is marked at the outer end by a gong buoy. A detached bank with depths of 13 to 17 feet is about 1 mile offshore 3.7 miles NE of Jacksonport.

Charts 14902, 14909

(872) **Baileys Harbor**, about 14 miles N of Whitefish Point, is a small bay protected on the E by a point that extends E, then S, from shore. Shoals that extend 1 mile S from the point are marked on the SW side by a buoy. A shoal with a least depth of 1 foot extends from shore on the W side of the harbor entrance. Shoals extend about 0.25 mile off the E shore of the harbor and 0.5 mile off the N and W shores. **Baileys Harbor Directional Light** (45°04.2'N., 87°07.2'W.), at the NW corner of the harbor, shows a higher intensity beam on **340°** which marks the best water into the harbor. Vessels approaching Baileys Harbor should keep 1.5 miles

offshore until the white sector is visible. A lighted bell buoy 3 miles SSE of the light, in the white sector, marks the harbor entrance.

(873) Baileys Harbor is sheltered and affords good anchorage, but is subject to considerable surge during heavy seas. Vessels should not anchor nearer than 0.5 mile of the N shore of the harbor, as the water is shallow and the sea that sets in during S gales is only partially broken by the shoals outside. The best holding ground is on the E side of the harbor.

(874) A yacht club on the NE side of Baileys Harbor provides transient berths, gasoline, diesel fuel, water, ice, electricity, and sewage pump-out. Emergency repairs are available.

(875) **Moonlight Bay** opens on the NE side of the point which forms the E side of Baileys Harbor. The bay has deep water to just inside the entrance and affords fairly good anchorage with protection from all but E to S winds.

(876) **Cana Island Light** (45°05.3'N., 87°02.8'W.), 83 feet above the water, is shown from a white conical tower on a small island connected to shore by a narrow neck 1.5 miles NE of Moonlight Bay. From the light N to North Bay, the shore is clear except for numerous submerged net stakes extending about 0.7 mile offshore. In 1995, a dangerous wreck was reported 2 miles NNE of Cana Island Light in about 45°06'52.7"N., 87°00'52.0"W.

(877) **North Bay,** 3 miles N of Cana Island Light, has a small area of deep water near its mouth and affords fair anchorage for small craft with protection from all but E winds. Entrance to the bay is constricted by shoals that extend off each entrance point. The shoals are marked at the ends by buoys. Vessels should take care to avoid abandoned net stakes in the entrance.

(878) From the point that encloses the E side of the North Bay, the shore extends N to Rowley Bay, enclosed on the E by a point on which is located Newport State Park. **Rowley Bay** affords only limited shelter, and the anchorage is not good. The N end of the bay is fouled by many rocky spots covered 2 to 14 feet.

(879) The approach to Rowley Bay is obstructed by numerous shoals. **Four Foot Shoal,** 3 miles long N and S, lies with its N end 1.4 miles S of the point which encloses the E side of the bay. A bank with numerous rocks awash is on the S end of the shoal, and the N end of the shoal has limiting depths of 2 to 6 feet. Buoys mark the W side and S end of the shoal. A shoal with rocks awash near the inner end and a depth of 11 feet near the outer end extends 1.1 miles S from Newport State Park and is marked by a buoy at the outer end. A detached shoal, marked on the S side by a buoy, has 2- and 9-foot spots 1 mile SW of Newport State Park. A shoal with a least depth of 1 foot extends from shore W of the N end of Four Foot Shoal and is marked at the outer end by a buoy. Rowley Bay may be entered W of Four Foot Shoal, between it and the shore to W. This passage is obstructed by a detached 9-foot shoal W of the midpoint of Four Foot Shoal; the shoal is marked by a buoy on the E side. The bay may also be entered N of Four Foot Shoal.

(880) **Sand Bay** is a small indentation on the W side of Rowley Bay 1.4 miles S of the head. Slips on the W side of the bay used by commercial fishermen are protected by breakwalls and provide shelter in all winds. The slips have depths of about 6 feet. A resort marina on the W side of the bay provides berths, electricity, gasoline, and sewage pump-out.

(881) The waters from Rowley Bay N to Porte des Morts Passage are rendered foul by an irregular bottom with shallow banks and detached spots. **Spider Island** is a heavily wooded island 0.6 mile SE of Newport State Park with very shallow spots between. A shoal with a least depth of 9 feet, marked on the S side by a buoy, is 0.7 mile SE of Spider Island. **Outer Shoal,** marked on the E side by a buoy, is the outermost part of the foul area and lies 2.5 miles NE of Spider Island. A 4-foot spot is 0.5 mile W of the buoy, and detached spots covered 6 to 18 feet are within 1.3 miles SW of the buoy.

(882) Waverly Shoal and Nine Foot Shoal are on the NE and SE corners, respectively, of an offshore bank E of the N end of Door Peninsula and on the S side of Porte des Morts Passage. **Waverly Shoal,** with a least depth of 12 feet and marked on the NE end by a lighted bell buoy, is 5.2 miles N of Spider Island. **Nine Foot Shoal,** just S of Waverly Shoal, has a least depth of 4 feet and is marked on the E side by a buoy.

(883) The N shore of Door Peninsula is deep-to through Porte des Morts Passage into Green Bay.

Charts 14902, 14908, 14909, 14910

(884) **Green Bay** is 118 miles long NE and SW, from the head of Big Bay de Noc to the mouth of Fox River, and has a maximum width of 23 miles. The bay is separated from Lake Michigan by two mainland peninsulas; **Garden Peninsula,** the N one, is 20 miles long, and **Door Peninsula,** the S one, is about 70 miles long. The entrance to Green Bay between the peninsulas is about 28 miles wide, but is so congested with islands and shoals that the passages between them have acquired the reputation of being dangerous. The main entrances are through Porte des Morts Passage, Rock Island Passage, St. Martin Island Passage, and Poverty Island Passage.

Charts 14902, 14909

(885) **Porte des Morts Passage**, the S entrance to Green Bay, is known as **Deaths Door,** due to the numerous detached shoals which obstruct it and the strong currents which set in or out of the passage according to the wind direction. The shores are rockbound and almost certain destruction to vessels going aground. These conditions have been the cause of many vessel disasters. The passage is bordered on the N side by Plum Island and Pilot Island and on the S side by Waverly Shoal and Door Peninsula.

(886) The entrance to Porte des Morts Passage from Lake Michigan is marked by a **330°30'** lighted range on the SW shore of Plum Island. The approach to the passage is marked by a lighted bell buoy on the range line 5.4 miles SSE of Plum Island.

(887) **Plum Island,** about 1 mile long and 0.7 mile wide, is about midway between Door Peninsula and Washington Island, the largest island in the entrance to Green Bay. Shoals extend about 0.3 mile off the W and E sides of the island. Detached 16- and 19-foot spots are about 0.6 mile E of the S end of the island. A shoal with a least depth of 1 foot extends N from the island and is marked on the E side by a lighted buoy 0.6 mile N of the island. The buoy can be passed close aboard on the E side, but a narrow ridge of 15- to 20-foot depths extends 0.4 mile N from the buoy. Anchorage on the E side of Plum Island, between it and Detroit Island, is safe and is occasionally used in E gales, but it is subject to considerable swell.

(888) **Pilot Island,** 1.7 miles SE of Plum Island, is on the NE side of the Lake Michigan entrance to Porte des Morts Passage. Shoals extend 0.3 mile SE and SW from the island. **Pilot Island Light** (45°17.1'N., 86°55.2'W.), 48 feet above the water, is shown from a square yellow tower, with a red roof, attached to a dwelling on the island.

(889) **Detroit Island,** 3.5 miles long, extends SE from the SW end of Washington Island. The NE side of the island is connected to the S side of Washington Island by a very shallow rocky bank. The width of this bank diminishes toward the SE end of Detroit Island, where the bank extends 0.5 mile SE and S.

(890) **Detroit Island Passage** leads between the SW end of Washington Island and Detroit Island on the NE and Plum Island on the SW. The passage is obstructed by several shoals off the SW side of Detroit Island. The most dangerous is a 3-foot spot marked on its SW side by a buoy near the middle of the passage. Vessels should not pass NE of the buoy without local knowledge. There is good water between the buoy and the shoals off Plum Island. A shoal bank with depths of 8 to 10 feet parallels the SW side of Detroit Island about 0.8 mile offshore.

(891) **Washington Island,** the largest in the entrance to Green Bay, is a wooded island about 5.5 miles square. The W and N shores of the island are bluff with deep water close-to. The NW point of the island is marked by a light. The E side of the island is bordered by a shoal bank with a greatest extent of 1.25 miles and depths of 9 to 12 feet at the outer edge. **Hog Island** is a small island on the widest part of the bank. A detached 9-foot spot is 0.6 mile SE of the SE point of the Washington Island.

(892) **Detroit Harbor** is a large, but shallow indentation in the S shore of Washington Island. The mouth of the harbor is protected by the N end of Detroit Island. A semicircular bight in the N end of Detroit Island forms a well protected area in the S part of the harbor. N of Detroit Island, the harbor has general depths of 7 to 10 feet and a rocky spot, covered 3 feet, near the center. Shallow-draft vessels with local knowledge may enter the harbor across the rocky bank which connects the NE side of Detroit Island to Washington Island. The main entrance to the harbor is W of Detroit Island. **Washington Island Coast Guard Station**, seasonally operated, is on the SW side of Detroit Harbor at the S end of Washington Island.

Channels

(893) A dredged entrance channel leads N from deep water in Detroit Island Passage between Washington Island and the W side of Detroit Island for 0.7 mile to a turning basin in the SW corner of Detroit Harbor. In September 1998, the midchannel controlling depth was 14 feet in the channel with 8½ to 14 feet in the basin. A light with a fog signal marks the W side of the channel entrance, and a lighted and several unlighted buoys mark the channel and basin.

Small-craft facilities

(894) Transient berths, gasoline, diesel fuel, water, ice, and electricity are available on the W side of the basin. A boatyard on the E side of Detroit Harbor provides transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and some marine supplies. An 8-ton mobile hoist and a 65-ton marine railway that can handle 65-foot craft are available for hull and engine repairs.

Ferry

(895) An automobile and passenger ferry operates from the W side of the basin to Gills Rock and Northport, on the N end of Door Peninsula.

(896) **Figenscaus Harbor (West Harbor)** is a small shallow indentation in the W shore of Washington Island. Its shoal water and exposure to W and NW winds

make it practically of no value for commercial purposes.

(897) **Washington Harbor** is a deep indentation in the N shore near the NW corner of Washington Island. The harbor has good water with bold shores, and although the bottom is ledge rock and poor holding ground for anchors, good protection is afforded from all but N winds.

(898) **Jackson Harbor** is a small shallow indentation in the NE corner of Washington Island. Immediately inside of the entrance, a small area about 250 feet by 200 feet in size has depths of 8 to 10 feet. A considerable part of the remainder of the harbor is from 7 to 4 feet deep.

Channels

(899) A channel leads from Green Bay across the bar at the mouth of the harbor to deeper water inside. The entrance is marked by two buoys and a light on the W side. The buoys are not charted because they are frequently shifted in position to mark the best water. Local knowledge is advised. In September 1998, the controlling depth was 4 feet (5½ feet at midchannel).

(900) Limited transient berths are available at Jackson Harbor.

Ferry

(901) A passenger ferry operates from Jackson Harbor to Rock Island, just NE.

(902) **Rock Island** is a State park connected close NE of Washington Island by a shallow rocky bank. The W, N, and E sides of the island are bluff with deep water close-to. A light on the NW corner of the island marks the S side of Rock Island Passage. The light is obscured from **275°** to **020°** by the dense foliage on Rock Island. A ferry operates from the State park pier on the SW side of the island to Jackson Harbor.

(903) **Fish Island** is a small island on a rocky bank 2.2 miles SE of Rock Island. The bank extends about 0.8 mile N and S from the island. **Fisherman Shoal,** 1.5 miles SSW of Fish Island, is about 1.3 miles long NW and SE and has several spots awash. The SE end of the shoal is marked by a lighted bell buoy. Both Fish Island and Fisherman Shoal are hazards to vessels navigating Rock Island Passage. A deep channel is between these banks and Washington and Rock Islands.

(904) **Rock Island Passage,** the widest passage into Green Bay, leads between Fish Island and Rock Island on the S and St. Martin Island Shoals on the N.

(905) The **State boundary** between Wisconsin and Michigan passes through Rock Island Passage.

(906) **St. Martin Island** is a wooded and hilly island 4.5 miles NNE of Rock Island. The W, N, and E shores of the island are generally deep-to. A shoal with depths of 3 to 19 feet extends 1.4 miles S from the SE point of the island.

(907) **St. Martin Island Shoals** are detached spots from about 1.5 to 2.3 miles S of St. Martin Island. The shoalest spot, covered 7 feet, is 2 miles S of the island with an 8-foot spot close N. From the 7-foot spot, the shoal extends 0.4 mile SW with depths increasing to 20 feet and is marked at the outer end by a buoy. A detached 13-foot shoal 0.7 mile E of the 7-foot spot is marked on the SE side by a buoy.

(908) **St. Martin Island Light** (45°30.3'N., 86°45.5'W.), 84 feet above the water, is shown from a white hexagonal tower on the NE point of St. Martin Island and marks the W side of St. Martin Island Passage.

(909) **Gull Island** and **Little Gull Island** are on the N and S ends, respectively, of a shoal bank 1.7 Miles E of the N end of St. Martin Island. Between the islands, the bank has depths of 2 to 3 feet. **Gravelly Island,** on the continuation of the bank N of Gull Island, is surrounded by very shallow water. A channel with a depth of about 17 feet leads E and W between Gull and Gravelly Islands. A buoy 0.6 mile SW of Gravelly Island marks the W side of the bank. **Gravelly Island Shoals** comprise three detached shoals N of the island; a 14-foot spot 0.4 mile N, a 13-foot spot 0.7 mile N, and an 18-foot spot 1.2 miles N. These shoals are a hazard to vessels transiting Poverty Island Passage.

(910) **St. Martin Island Passage** leads between Gravelly and the Gull Islands on the E and St. Martin Island on the W. A lighted bell buoy about 0.4 mile S of Little Gull Island marks the Lake Michigan entrance to the passage. From a point about 0.6 mile S of the buoy, the course through the passage is **319°.**

(911) **Poverty Island,** 2.6 miles ENE of Gull Island, is marked on the S end by an abandoned lighthouse. The W side of the island, fronting Poverty Island Passage, is deep-to. A shoal extends 0.4 mile E from the S end of the island, and a shoal bank connects the NE side of the island with Summer Island, 1 mile NE. A dangerous wreck was reported in 1995, 2.5 miles S of Poverty Island Light.

(912) **Poverty Island Shoal,** 1.8 miles NW of Poverty Island, extends 1 mile N and S and has a least depth of 13 feet.

(913) **Poverty Island Passage** leads between Poverty Island and Poverty Island Shoal on the NE and the Gull Islands, Gravelly Island, and Gravelly Island Shoals on the SW. In addition to Poverty Island Shoal and Gravelly Island Shoals, the passage is also obstructed by a detached 20-foot spot 1 mile NE of Gravelly Island. Vessels bound for Green Bay should pass about 0.75 mile S of Poverty Island and then shape their course to pass between Poverty Island Shoal and Gravelly Island Shoals.

The passage should only be navigated by light-draft vessels.

Charts 14902, 14908, 14909

(914) **Summer Island** and **Little Summer Island,** the northernmost islands in the mouth of Green Bay, are 2 miles S and 3 miles W, respectively, of **Point Detour,** the S tip of Garden Peninsula which encloses the N end of Green Bay. The islands are connected by a sandy and stony flat which also reaches NE to the mainland. There are numerous rocks awash in this area. Depths over the flat are 1 to 3 feet between the islands and 5 feet between the islands and the mainland except for a narrow 6-foot channel that closely follows the shore. This channel is obstructed by a 1-foot spot marked on the NW side by a buoy. Shoals extend 1 mile W from Little Summer Island. **Rocky Island** and several small bare spots are on this bank. **Little Summer Island Shoal,** with a least depth of 6 feet, is 1 mile SW of Little Summer Island. A shoal bank with depths of 10 to 19 feet connects the S end of Summer Island to Poverty Island. The deeper water is close to Poverty Island. Summer Island is marked on the NE side by a light.

Charts 14902, 14909

(915) From Porte des Morts Passage, the W shore of Door Peninsula extends generally SSW for 34 miles to the mouth of Sturgeon Bay. **Hedgehog Harbor,** a deep-water bight at the N end of the peninsula, is enclosed on the E by **Table Bluff** and on the W by **Deathdoor Bluff.** The harbor is well sheltered from S winds. **Gills Rock, Wis.,** a small village on the SE side of the harbor, is the terminous for passenger and automobile ferries operating to Detroit Harbor and Rock Island. A detached 15-foot shoal is 0.3 mile N of Deathdoor Bluff.

(916) **Ellison Bluff,** 3.5 miles SSW of Deathdoor Bluff, encloses the W side of **Ellison Bay.** The bay opens to the NW and provides protection from S and E winds. Good holding ground is in the S part of the bay in depths of 15 to 40 feet. **Ellison Bay, Wis.,** is a village at the head of the bay. Berths, gasoline, water, ice, and launching ramps are available.

(917) From Ellison Bluff, the bluff shore extends 4.7 miles S to the head of Sister Bay. There is deep water close-to, except for a 15-foot shoal extending 0.5 mile from shore about 2.5 miles S of Ellison Bluff. **Sister Bay,** enclosed on the W by **Sister Bluffs,** provides good anchorage with protection from ENE to W winds, mud and sand bottom. **Sister Bay, Wis.,** a village at the head of the bay, has a marina which provides complete small-craft services. Craft to 38 feet can be hauled out for hull and engine repairs.

(918) The waters NW of the mouth of Sister Bay are obstructed by several shoals and small islands. **Sister Islands,** two small islands on a shallow bank, are 2.5 miles NNW of the head of Sister Bay. The bank, which extends 0.2 mile N and 0.6 mile S from the islands, is marked on the W side by a buoy. A detached shoal with least depths of 12 feet is 1.2 miles S of the Sister Islands. **Sister Shoals** comprise a group of detached shoals from 0.6 to 1.5 miles N of the W end of Sister Bluffs. The shoals, with a least depth of 1 foot at the N end, are marked on the W side by a buoy. **Horseshoe Reefs,** 3 miles NW of Sister Bluffs, extend 2.6 miles NE and SW. These rocky reefs have a least depth of 1 foot and are marked on the SE side by a lighted buoy.

(919) **Eagle Harbor** is a bay extending 2 miles S into the shoreline between Sister Bluffs on the E and Eagle Bluff on the W. The harbor has deep water within 0.8 mile of its head, except for detached 16- and 17-foot spots in the center. The outer part of the harbor affords good anchorage with protection from all but N and NW winds. **Ephraim, Wis.,** a village on the SE side of the harbor, has small-craft facilities providing gasoline, diesel fuel, water, ice, and engine repairs.

(920) **Eagle Bluff,** forming the W side of the mouth of Eagle Harbor, is marked by a prominent observation tower. **Nicolet Bay (Shanty Bay)** is a small bight opening just W of the tower. **Eagle Bluff Light** marks the W side of the point that encloses the W side of Nicolet Bay. The light is obscured from **220°** to **030°** by trees. **Horseshoe Island,** off the mouth of Nicolet Bay, is marked on the SW side by a light.

(921) From Eagle Bluff Light, the shore is bluff for 2.7 miles S to Fish Creek. The **Strawberry Islands** are a group of four small islands on a shoal bank which parallels this stretch about 1 mile offshore, from about 2.5 miles SW to 1 mile NW of Eagle Bluff Light. The SW edge of the shoal bank is marked by a buoy. **Strawberry Channel,** leading between the island group and the mainland, is marked on the E by Eagle Bluff Light and on the W by a lighted bell buoy and a buoy which mark the SE and NE edges of the shoal bank, respectively. The narrowest part of the channel, abreast the lighted bell buoy, has a depth of 13 feet. The buoy should be passed close aboard to avoid a shoal that extends from the shore.

(922) **Chambers Island,** 3.5 miles W of the Strawberry Islands, is in the middle of Green Bay. Shoals that extend about 1.9 miles N from the NE point of the island are marked on the outer end by a lighted bell buoy. A shoal with depths of 12 to 16 feet that extends 1.4 miles W from W side of the island is marked at the outer end by a lighted bell buoy. Shoals extend 0.7 mile off the SW

shore of the island and 1.5 miles off the E shore. An 8-foot spot is on the outer edge of the shoals off the E shore. **Hanover Shoal,** with depths of 1 to 5 feet, extends 2 miles SE from the SE point of the island and is marked at the outer end by a buoy. Strangers should not attempt passage between Hanover Shoal and the Strawberry Islands. **Chambers Island Light** (45°12.1'N., 87°21.9'W.), 97 feet above the water, is shown from a skeleton tower on the NW side of the island. The light is a guide to the passage between the island and the W shore of Green Bay.

(923) **Fish Creek, Wis.,** is a village on the SW side of **Fish Creek Harbor** 2.7 miles S of Eagle Bluff Light. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out, and hull and engine repairs are available. A **special anchorage** is in the bight. (See **110.79c,** chapter 2, for limits and regulations.)

(924) From Fish Creek Harbor S for about 6 miles to Egg Harbor the shore is bluff and deep-to. **Hat Island** is 2.8 miles offshore at about the middle of this stretch. Shoals extend 0.4 mile SE from the island. A detached 14-foot shoal is 1.3 miles NE of the island, and a rock awash, marked on the E side by a buoy, is 0.7 mile S.

(925) **Egg Harbor,** 8 miles S of Eagle Bluff Light, is a deep indentation open to the NW. The harbor affords good anchorage with protection from all but NW to N winds, mud bottom. **Egg Harbor, Wis.,** a village on the SE side of the bay, has a public dock with transient berths, electricity, gasoline, sewage pump-out, and a launching ramp.

Charts 14902, 14909, 14910

(926) From Egg Harbor, the shore is deep-to for 1.5 miles SW to **Leroys Point.** From Leroys Point for the stretch of 5 miles SW, to a point 3 miles SW of **Horseshoe Point,** the shore is bordered by shoals and numerous detached spots with depths of 6 to 10 feet within 1 mile of shore. **Monument Shoal,** near the S end of this stretch, is marked on the W side by a buoy. A 7-foot shoal is 1 mile S of the buoy. The shore in this stretch should be given a berth of 2 miles.

Charts 14902, 14910, 14918, 14919

(927) The shore from Monument Shoal SSW for 6 miles to the mouth of Sturgeon Bay is clear except for a 17-foot spot 0.6 mile offshore 3 miles N of the bay.

(928) **Sturgeon Bay** (described with the Sturgeon Bay Ship Canal) extends about 8 miles SE from Green Bay.

Caution

(929) Aids to navigation in Sturgeon Bay have been placed with respect to traversing the bay from Lake Michigan through the Sturgeon Bay Ship Canal to Green Bay.

(930) **Sherwood Point Light** (44°53.6'N., 87°26.0'W.), 61 feet above the water, is shown from a white square tower with attached dwelling on the SW side of the entrance to Sturgeon Bay.

(931) From Sherwood Point Light the shore trends SW for 4 miles to a narrow peninsula that extends 1.2 miles NW from shore. **Snake Island** is close off the end of the peninsula. From the NE side of the peninsula and Snake Island, a shoal bank with depths of 2 to 18 feet extends 3.5 miles NNE. **Sherwood Point Shoal,** a detached 11-foot shoal marked on the N side by a lighted buoy, is off the N end of this shoal bank and 1.9 miles NNW of Sherwood Point. These shoals are a hazard to vessels navigating between Sturgeon Bay and the S end of Green Bay and should be given a wide berth.

(932) **High-Cliff Park** is a small privately maintained artificial harbor 1.5 miles SW of Sherwood Point Light. The W side of the harbor entrance is protected by a breakwater. In 1978, the reported controlling depths were 4 feet in the entrance channel and harbor. Due to obstructions in the entrance, the harbor should not be entered without local knowledge.

(933) A small bay on the S side of Snake Island has depths of 15 feet or more in the center and shoals toward shore. A privately dredged canal cuts across the W point of the bay to Little Sturgeon Bay.

(934) **Little Sturgeon Bay** opens to the N about 6 miles SW of the mouth of Sturgeon Bay. The bay has central depths of 7 to 15 feet with shoals along the shores. In September 1987, severe shoaling was reported to exist on the NW side of the bay in about 44°50'38"W., 87°33'04"W. An inn on the W side of the bay has transient berths with water and electricity.

(935) From Little Sturgeon Bay SW for about 7 miles, the shore is generally deep-to, thence for 16 miles SW to the village of **Red Banks, Wis.,** the shoal border is 0.25 to 1 mile wide. A detached 10-foot shoal is 1.5 miles offshore 3.5 miles N of Red Banks. The S end of Green Bay, from Red Banks to the mouth of Fox River, has depths of 18 feet and less. From **Point Sable** (44°34.7'N., 87°54.7'W.), 3 miles SW of Red Banks, **Frying Pan Shoal,** with 1-foot depths and spots awash extends W across the Bay to Long Tail Point. A dredged deep-draft channel leads through the shoals at the S end of Green Bay to the mouth of Fox River.

Charts 14910, 14916, 14918

(936) **Green Bay Harbor,** at the mouth of **Fox River** at the S end of Green Bay, serves the cities of **Green Bay, Wis.,** and **De Pere, Wis.** The major commodities handled at the port are coal, limestone, wood pulp, cement, aggregates, and agricultural products.

Prominent features

(937) The most prominent objects in the approach to Green Bay are a tank 4 miles ESE of the mouth of Fox River, a lighted stack 1.1 miles S of the river mouth, a stack 2.1 miles NW of the river mouth, and a tank 3.5 miles NW of the river mouth at the town of Howard.

(938) **Green Bay Harbor Entrance Light** (44°39.2'N., 87°54.1'W.), 72 feet above the water, is shown from a white conical tower on a cylindrical base on the W side of the entrance channel 9.3 miles NE of the mouth of Fox River. A fog signal is at the light.

Channels

(939) The dredged entrance channel leads generally SW through the shallow water in the S end of Green Bay for about 11.5 miles to the mouth of Fox River and thence upstream for about 7.2 miles to a turning basin at De Pere. Other turning basins are on the E side of the channel 1.4 miles above the mouth at the mouth of East River and on the W side of the channel 3.6 miles above the mouth, just above the Canadian National Railroad bridge. The entrance channel is well marked by lighted ranges, lights, lighted and unlighted buoys. The river channel is marked by buoys from the second turning basin to the turning basin at De Pere.

(940) In May-October 2005, the controlling depths were 18.8 feet (20.8 feet at midchannel) in the entrance channel through the S end of Green Bay to the mouth of the Fox River. A large shoal area, the S tip of Long Tail Point encroaching into the channel, is in the right half of the channel between Lighted Buoy 16A and Light 18 and has a least depth of 2.7 feet. From the mouth of the Fox River, the controlling depth in the river channel was 19.5 feet (23.5 feet at midchannel) to the Walnut Street bascule bridge, thence 15.5 feet (19.8 feet at midchannel) to the second turning basin just above the Canadian National Railroad bridge; thence in May-August 2003, 5.7 feet (6.6 feet at midchannel) to the De Pere turning basin. Depths in the turning basins were: at the mouth of the East River, 16 to 22 feet; just above the Canadian National Railroad bridge, 20 feet; and at De Pere, 9 to 18 feet with gradual shoaling to 2 feet towards the W corner. **Mariners are advised to contact the Port Director, Port of Green Bay, for the latest controlling depths.**

(941) **East River** empties into the E side of Fox River 1.3 miles above the mouth. The river is navigable to Baird Street bridge, 1.3 miles above the mouth. A depth of about 5 feet can be carried through the narrow and tortuous channel.

Caution

(942) **Grassy Island,** on the E side of the entrance channel, 1.3 miles NE of the Fox River mouth, and **Cat Island,** on the W side of the channel opposite, partially cover during periodic high-water conditions. Grassy Island is marked on the NW end by a light.

(943) In the approaches to Fox River, outside the limits of the dredged channel, numerous uncharted fish nets and stakes make navigation hazardous, particularly for strangers.

(944) A crescent-shaped spoil area is about 1 mile E of the mouth of Fox River.

Fluctuations of water level

(945) Changes in wind direction or barometric pressure occasionally cause temporary water level fluctuations of up to 2½ feet above or below the prevailing mean lake level.

Currents

(946) Currents in Fox River attain velocities to 3 mph and may run in either direction.

Weather, Green Bay and vicinity

(947) Green Bay Wisconsin, is located in the eastern portion of the state at the head or southwest end of Green Bay. The Bay is oriented northeast-southwest and is separated from Lake Michigan to the southeast by the Door Peninsula. The location averages about seven days each year with maximum temperatures in excess of 90°F (32.2°C). July is the warmest month with an average high of 81°F (27.2°C) and an average minimum of 59°F (15°C). January is the coolest month with an average high of 23°F (-5°C) and an average minimum of 7°F (-13.9°C). The highest temperature on record for Green Bay is 103°F (39.4°C) recorded in July 1995 and the lowest temperature on record is -31°F (-35°C) recorded in January 1951. About 163 days each year experience temperatures below 32°F (0°C) and an average 38 days each year records temperatures below 5°F (-15°C). Every month has seen temperatures at or below 40°F (4.4°C) and every month except July and August has recorded temperatures at or below freezing (0°C).

(948) The average annual precipitation for Green Bay is 28.49 inches (724 mm). An annual maximum occurs during the summer, due mainly to convective activity, and a marked dry period occurs during the winter

months. Precipitation falls on about 189 days each year. The wettest month is July with 3.45 inches (88 mm) and the driest, February, averages only 1.02 inches (25.9 mm). An average of 33 thunderstorm days occur each year with June, July and August being the most likely months. Snow falls on about 80 days each year and averages about 47 inches (1194 mm) each year. December and January each average about 11 inches (279 mm) per year. Ten-inch (254 mm) snowfalls in a 24-hour period have occurred in each month November, December, March and April. About ten days each year has a snowfall total greater than 1.5 inches (38 mm) and snow has fallen in every month except June, July, and August. Fog is present on average 129 days each year and is rather evenly distributed throughout the year with a slight maximum during the late summer season.

(949) The prevailing wind direction in Green Bay is the southwest. Winter through early spring is the windiest period and a maximum gust of 70 knots occurred in May 1989.

(950) (See Page 544 for **Green Bay Climatological table.**)

Towage

(951) Tugs to 1,200 hp are available at Green Bay. Arrangements are made through Selvick Marine Towing Corporation's dispatch office in Sturgeon Bay at 414-743-6016 or Great Lakes Towing Company's dispatch office in Cleveland at 800-321-3663; at least 4 hours advance notice is requested.

(952) **Green Bay Coast Guard Station,** seasonally operated, is on the E side of the mouth of Fox River.

(953) Green Bay is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(954) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(955) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) RABIC CP6A300

Harbor regulations

(956) Local harbor regulations are established by the City of Green Bay and enforced by the Port Director who can be reached at the Brown County Board of Harbor Commissioners, The Port of Green Bay, Wisconsin, Courthouse, Green Bay, Wis. 54301. Copies of the regulations can be obtained from the Port Director. A 4 mph (3.5 knots) **speed limit** is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Local bridge regulations

(957) Section 1. (a) Except on Sundays and legal holidays, the draws of bridges will not be required to open from 7:00 a.m. to 8:00 a.m., from 12:00 noon to 1:00 p.m., and from 4:00 p.m. to 5:00 p.m.: Provided, that the draw shall be opened promptly at all times for the passage of vessels carrying United States mails, vessels belonging to the United States, vessels of 300 short tons or over cargo capacity engaged in commercial transportation and their attendant towing tugs, and tugs or fireboats when responding to emergency calls.

(958) Sec. 2. No vessel, craft, or float shall approach or pass through any such bridge at a greater speed than 5 miles per hour.

Wharves

(959) Green Bay has numerous docks and wharves on both sides of the Fox River. Only the deep-draft facilities are described. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) Most of the facilities described have rail and highway connections. Water and electrical shore-power connections are available at several docks.

Facilities on the W side of Fox River:

(960) **Wisconsin Public Service Corp., Pulliam Power Plant Slip:** N side of the slip 0.2 mile above the river mouth; 480 feet of berthing space between breasting dolphins; 19 feet alongside; deck height, 6½ feet; open storage for 600,000 tons of coal; receipt of coal; bunkering of vessels; owned and operated by Wisconsin Public Service Corp.

(961) **Koch Fuels, North Dock:** outer part of the N side of the slip 0.3 mile above the river mouth; 355-foot face; 18 feet alongside; deck height, 5 feet; pipeline extends to tank storage for 40,000 barrels; receipt of petroleum products; owned by F. Hurlbut Co. and operated by Koch Fuels, Inc.

(962) **Hurlbut North Dock:** center part of the N side of the slip 0.3 mile above the river mouth; 745-foot face; 18 feet alongside; deck height, 5 feet; open storage for 50,000 tons of sand and limestone; receipt of limestone, sand, salt, coal, and petroleum coke; owned and operated by F. Hurlbut Co.

(963) **Hurlbut South Docks:** two sections on S side of the slip 0.3 mile above the river mouth; 200- and 500-foot faces; 19 feet alongside; deck height, 5 feet; open storage for 200,000 tons of material; receipt of limestone, aggregate, salt, and coal; owned and operated by F. Hurlbut Co.

Structures across Fox River below De Pere and East River
**Miles above the mouth of Fox River*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Low Water Datum	Remarks
				Right	Left	Center		
	Fox River							
1	Overhead cable	Power	0.08				155	
2	Tower Drive bridge	Highway	0.41			402	120	Fixed. Note 1.
3	Overhead cable	Power	0.45				159	
4	Canadian National RR bridge	Railroad	1.03	85	85		7	Swing. Note 2.
	Junction With East River		1.21					
5	Main St. bridge	Highway	1.58			120	12	Bascule. Note 3.
6	Walnut St. bridge	Highway	1.81			124	11	Bascule. Note 3.
7	Overhead cable	Power	2.02				153	
8	Tilleman Memorial Bridge	Highway	2.27			124	32	Bascule. Note 3.
9	Wisconsin Central	Railroad	2.61	75	75		8	Swing. Note 2.
10	Canadian National RR bridge	Railroad	3.31	75	75		31	Swing. Note 2.
11	Allouez and Ashwaubenon bridge	Highway	5.02			150	60	Fixed.
	East River							
12	Overhead cable	Power	1.41				66	
13	Monroe Ave. bridge	Highway	1.56			60	13	Fixed.
14	Green Bay & Western RR bridge	Railroad	1.60	60	60		6	Swing. Note 4.
15	Overhead cable	Power	1.72				61	
16	Western Ave bridge	Highway	1.92			41	10	Fixed.
17	Green Bay & Western RR bridge	Railroad	2.21	60			7	Swing. Note 4.
18	Main St. bridge	Highway	2.28			60	7	Fixed.
19	Baird St. bridge	Highway	2.66		40		10	Fixed.
20	Walkway bridge	Pedes-trian	2.95			55	12	Fixed.
21	Overhead cable	Power	3.31					Data not available.
22	Mason St. bridge	Highway	3.52				9	Fixed.
23	Overhead cable	Power	3.64					Data not available.
24	Overhead cable	Power	4.71					Data not available.
25	Canadian National RR bridge	Railroad	4.72				13	Fixed.

Note 1.–Vertical clearance at center of span.

Note 2.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 3.–See **33 CFR 117.1 through 117.59 and 117.1087**, chapter 2, for drawbridge regulations.

Note 4.–Reported removed 1996.

(964) **Koch Fuels, South Dock:** center part of the S side of the slip 0.3 mile above the river mouth; 425-foot face; 19 feet alongside; deck height, 5 feet; tank storage for 55,000 barrels of asphalt and 55,000 barrels of bunker C; receipt of asphalt and bunker C; owned by F. Hurlbut Co. and operated by Koch Fuels, Inc.

(965) **Hurlbut Salt Dock:** outer end of the S side of the slip 0.3 mile above the river mouth; 150-foot face, natural bank; 19 feet alongside; deck height, 4 feet; open storage for 100,000 tons of salt; receipt of salt; owned and operated by F. Hurlbut Co.

(966) **Amoco Oil Co. Dock:** 0.8 mile above the river mouth; 355-foot face; 19 to 21 feet alongside; deck height, 5 feet; tank storage for 737,000 barrels; receipt and shipment of petroleum products; owned and operated by Standard Oil Division of Amoco Oil Co.

(967) **Anamax Corp. Wharf:** 0.2 mile above Amoco Oil Co. Dock; 241-foot face; 23 feet alongside; deck height, 5 feet; tank storage for about 6,000 tons of tallow; shipment of liquid tallow; owned and operated by Anamax Corp.

(968) **Western Lime and Cement Co. Wharf:** 0.25 mile above Anamax Corp. Wharf; 450-foot face; 23 feet alongside; deck height, 4 to 5 feet; open storage for 105,000 tons of limestone; receipt of limestone; owned and operated by Western Lime and Cement Co.

(969) **Leicht Transfer and Storage Co., North Dock No. 1:** immediately above Western Lime and Cement Co. Wharf; 500-foot face; 22 to 25 feet alongside; deck height, 8 feet; cranes to 30 tons; 43,000 square feet covered storage; 30,000 square feet open storage; receipt and shipment of general cargo; owned and operated by Leicht Transfer and Storage Co.

(970) **Leicht Transfer and Storage Co., North Dock No. 2:** immediately above Leicht Transfer and Storage Co., North Dock No. I; 961 feet of berthing space; 24 to 28 feet alongside; deck height, 8 feet; cranes to 30 tons; 105,000 square feet covered storage; 52,000 square feet open storage; receipt and shipment of general cargo, pig iron, and miscellaneous bulk materials; owned and operated by Leicht Transfer and Storage Co.

(971) **Fort Howard Paper Co., Northern Coal Dock:** 0.3 mile above Walnut Street bridge; 503-foot face; 24 feet alongside; deck height, 5 feet; open storage for 140,000 tons of material; receipt of salt and coal; owned and operated by Fort Howard Paper Co.

(972) **The C. Reiss Coal Co. Wharf:** immediately above Tilleman Memorial (Mason Street) Bridge; 1,592-foot face; 18 to 23 feet alongside; deck height, 7 feet; open storage for 580,000 tons of coal; bridge crane with unloading rate 700 tons per hour; receipt of coal, pig iron, salt, and miscellaneous bulk materials; coal and oil bunkering; owned and operated by C. Reiss Coal Co.

(973) **LaFarge Corporation Terminal:** N side of the slip 0.65 mile above Tilleman Memorial Bridge; 426 feet of berthing space with dolphins; 19 feet alongside; deck height 8½ feet; storage silos for 15,000 tons of cement; receipt of bulk cement; owned and operated by Lafarge Corporation of Green Bay.

(974) **Leicht Transfer and Storage Co., State Street Dock:** N side of the slip 0.2 mile above Lafarge Corporation Terminal; 540-foot face; 19 feet alongside; deck height, 6 feet; open storage for 40,000 tons of salt; receipt of wood pulp and salt; owned and operated by Leicht Transfer and Storage Co.

(975) **Fort Howard Paper Co. Wharf:** S side of the slip 0.4 mile above the Lafarge Corporation Terminal; 1,100-foot face; 20 feet alongside; deck height, 7 feet; open storage for 450,000 tons of coal and salt; 110-ton derrick; receipt and shipment of heavy-lift items; receipt of coal, wood pulp, and salt; owned and operated by Fort Howard Paper Co.

Facilities on the E side of Fox River:

(976) **James River Dock:** immediately below the mouth of East River; 1,027 feet of berthing space; 11 to 20 feet alongside; deck height, 6 feet; receipt of pulp wood; owned and operated by James River Co.

(977) **U.S. Oil, Inc., Dock:** 0.3 mile above river mouth; 298 feet of berthing space with dolphins; 21 feet alongside; deck height, 8 feet; storage tanks for 488,000 barrels; receipt of petroleum products; owned and operated by U.S. Oil, Inc.

Supplies

(978) Limited marine supplies and adequate foodstuffs are available. Water is available upon arrangements at Anamax Corp. Wharf, Leicht Transfer and Supply Co., North Dock Nos. 1 and 2, Lafarge Corporation Terminal, and James River Dock. Bunker C and diesel oil are available by truck.

Repairs

(979) Marine radio and radar repairs are available at Green Bay.

Small-craft facilities

(980) Most of the facilities along the shores of Fox River offer all or some of the following services: transient berths, gasoline, diesel fuel, water, ice, electricity, marine supplies, launching ramps, pumpout service, a lift and /or a marine railway. Demasting service is available on the E side of the river at the mouth, about 3 miles above the mouth, and on the W side about 0.9 mile above the mouth.

Communications

(981) Green Bay has highway and rail connections. Passenger and freight air service is available at the airport W of the city.

Chart 14916

(982) **Fox River** rises above Berlin, Wis., and flows generally E, flowing through Lake Butte des Morts before emptying into the W side of **Lake Winnebago** at Oshkosh, Wis. The lower Fox River flows from the N end of Lake Winnebago at Menasha, Wis., and flows generally NE for about 39 miles to Green Bay. Above De Pere, Wis., the lower Fox River has been improved as necessary to provide a 6-foot channel to Lake Winnebago.

Caution

(983) Mariners transiting the Fox River from De Pere to Menasha are cautioned to stay within the channel. Depths outside the channel are very shallow over bedrock. Vessels have suffered severe damage from slight departures from the channel. The river is marked by private buoys and they may be relocated without prior notice.

(984) The rise from Low Water Datum at Green Bay to the level of Lake Winnebago is about 168.3 feet. This rise is accomplished by 17 locks and 2 guard locks. These locks have an available length of 144 feet, width of 35 feet, and depth of 6 feet over the sills at normal pool level. Lockage is provided from about May 15 to October 15, as determined by the District Engineer, U.S. Army Corps of Engineers. Under a lease agreement, the locks are operated by the State of Wisconsin, Fox River Management Commission. Information about specific operating hours and user fees can be obtained from the Fox River Management Commission, 1163 W. Main Street, Appleton, WI 54911 (telephone 920-993-6999) or the U.S. Army Corps of Engineers, Fox River Sub-Office (telephone 920-766-3531). (See **33 CFR 207.460(a)**, chapter 2, for lock regulations.)

(985) High-water periods on the Fox River, with currents up to 3 to 5 mph, continue for about 2 months on the average, beginning the latter part of March and extending into May. The low-water periods on the river average about 40 days, beginning in July and extending into September.

Caution

(986) During periods of moderate to high flow, mariners should be careful to avoid being drawn over the Menasha Dam by the hazardous outdraft.

(987) **Drydock.**–A drydock basin is adjacent to the third lock at **Kaukauna, Wis.,** 23 miles above the mouth of Fox River. The drydock is owned by the U.S. Government, but is available for public use. It is fitted with wooden lock gates, and is filled by gravity through valves in the gates and emptied through a concrete culvert below the third lock. The drydock is 142 feet long with 132 feet on the keel blocks, has a width of 35 feet at the entrance, and has a depth of 6 feet over the sill. The widths inside the basin are 125 to 64 feet at the bottom and 173 to 91 feet at the top. (See **33 CFR 207.460(b),** chapter 2, for drydock regulations.)

(988) **Menasha, Wis.,** is on the N side of Fox River at the outlet from Lake Winnebago. The dredged channel in the river leads from the lake between Menasha and **Doty Island,** in the center of the lake outlet. Two highway bridges and a railroad bridge cross the river at Menasha.

Menasha bridge regulations

(989) Section 1. It shall be unlawful for any person, persons, firm, partnership, or corporation to operate a boat upon the Government Canal within the corporate limits of the city of Menasha in such manner as to require the opening of the Racine Street or Washington-Tayco Street drawbridges during the following hours: 12:00 midnight to 8:00 a.m.; 11:50 a.m. to 12:10 p.m.; 12:45 p.m. to 1:00 p.m. and 3:40 p.m. to 4:15 p.m.

(990) Sec. 2. Any person, persons, firm, partnership, or corporation violating the provisions of section 1 shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed $25 or by imprisonment in the county jail not more than 30 days, or by both such fine and imprisonment.

Anchorages

(991) Special anchorages are at **Neenah, Wis.** in the Fox River S of Doty Island at its confluence with Lake Winnebago. (See **33 CFR 110.1 and 110.79**, chapter 2, for limits and regulations.)

(992) **Lake Winnebago** is about 28 miles long with a maximum width of about 10 miles and a greatest depth of 20 feet. The waters of the lake are contained by dams on either side of Doty Island and by a lock at Menasha. Lake levels are usually highest between April and June and lowest between December and February.

Chart Datum, Lake Winnebago

(993) During the navigation season, water levels are regulated to stay within prescribed limits above Low Water Datum, 745.1 feet above Pointe-au-Pere (Father Point), Quebec, on International Great Lakes Datum (1955).

(994) **Lighthouse Reef,** with rocks awash, is in the approach to the dredged river channel at Menasha.

Caution

(995) Extensive fish nets are placed in Lake Winnebago from April through June by the Wisconsin Department of Natural Resources. Information on the location of the nets may be obtained from Wisconsin Department of Natural Resources, Calumet Harbor Station, P.O. Box 374, Fond du Lac, Wis. 54935.

(996) The N shore of the lake is wooded and of moderate height. **High Cliff State Park,** at the NE corner of the lake, has a small-craft basin. The entrance to the basin is protected by converging breakwaters. Transient berths and launching ramps are available.

(997) **Stockbridge Harbor** and **Brothertown Harbor** are small harbors on the E side of Lake Winnebago, 10.5 and 17 miles SE of Menasha, respectively.

(998) **Calumet Harbor** is on the SE side of the lake at the mouth of **Pipe Creek.** In 1978, the dredged entrance channel had a controlling depth of 4 feet except for shoaling along the channel edges. Transient berths, water, and launching ramps are available.

(999) **Fond du Lac** is a small-craft harbor at the S end of Lake Winnebago at the mouth of **Fond du Lac River.** A tank 1.4 miles S of the river mouth is prominent.

Channels

(1000) A dredged channel leads from Lake Winnebago to the mouth of Fond du Lac River and upstream for 0.6 mile. In 1978, the midchannel controlling depth was 3½ feet. Overhead cables crossing the channel about 0.5 mile above the mouth have a reported least clearance of 60 feet.

Small-craft facilities

(1001) Transient berths, gasoline, water, electricity, and sewage pump-out facilities are available in the municipal basin 0.8 mile E of the river mouth. The entrance channel and basin have depths of 4 to 7 feet.

(1002) **Oshkosh, Wis.,** is on the W side of Lake Winnebago, 13 miles S of Menasha, at the mouth of the upper Fox River. A tank 0.3 mile SW of the river mouth and a tower 0.8 mile NE of the river mouth are prominent.

Small-craft facilities

(1003) A marina protected by breakwaters just S of the mouth of Fox River provides transient berths, gasoline, diesel fuel, water, electricity, and a launching ramp. Sewage pump-out facilities, marine supplies, hoists, and hull and engine repairs are available at marinas on the S side of Fox River.

Anchorage

(1004) A **special anchorage** area is in the S part of **Miller Bay,** about 1.8 miles N of the mouth of Fox River.

(1005) From Lake Winnebago, the **Fox River** extends 3 miles NW to **Lake Butte des Morts.** This section of the river has depths of 12 feet or more at midchannel. A winding channel leads through Lake Butte des Morts, and thence Fox River extends SW from the SW side of the lake. The towns of **Omro, Wis., Eureka, Wis.,** and **Berlin, Wis.,** are about 4, 10, and 18 miles above the lake, respectively. In 1978, it was reported that depths of about 3 feet could be carried to Berlin.

(1006) Pools on the upper Fox River are maintained by water control structures at Fort Winnebago, Governor Bend, Montello, Grand River, Princeton, White River, and Berlin. The locks at these locations have been removed; hand-operated haulovers are available at Montello, Grand River, Princeton, White River, Berlin, and Eureka to move small-craft between pools. A lock at Eureka is operated on weekends and holidays from May 25 through September 30

(1007) **Wolf River** flows from the N and joins Fox River at **Winneconne, Wis.,** at the NW end of Lake Butte des Morts. Wolf River has a project depth of 4 feet from the mouth upstream for about 47 miles to New London. The river banks rise 4 to 10 feet above the low-water surface; during flood stage the river rises 6 to 12 feet above the summer stage and during freshets the banks are generally overflowed.

Charts

(1008) The E half of Lake Butte des Morts is covered by NOS Chart 14916. Coverage of the upper Fox River and the Wolf River above Lake Butte des Morts is on maps available from Fox River Marina, Inc., Oshkosh, Wis.

Charts 14918, 14910

(1009) The head of Green Bay, from the mouth of Fox River N for about 3.5 miles to Long Tail Point on the W and Point au Sable on the E, is filled by a shallow expanse through which the entrance channel to the Fox River has been dredged.

(1010) **Long Tail Point,** a low ridge submerged in places, reaches SE about 3 miles from the shoreline just S of the mouth of Suamico River. **Dead Horse Bay,** on the SW side of Long Tail Point, has good anchorage for small craft in depths of 8 to 10 feet, sand and gravel

Structures across Fox River from De Pere to Lake Butte des Morts

miles above the mouth of the river

****Clear width in feet proceeding upstream***

No.	Location and Name	Kind	Miles*	Clear width in feet of draw and span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Low	High	
	De Pere Lock		7.15						
1	Overhead cable	Power	7.17				69		
2	De Pere-George St. bridge	Highway	7.27			75	24		Bascule. Note 1.
3	Overhead cable	Power	12.67				83		
4	Overhead cable	Power	12.86				85		
5	Overhead cable	Power	13.10				77		
	Little Kaukauna Lock		13.12						
6	Overhead cable	Power	17.28				80		
7	Wrightstown bridge	Highway	17.36			70	16		Bascule. Note 3.
	Rapide Croche Lock		19.16						
8	Overhead cable	Power	19.50				86		
	Kaukauna Lock 5		22.69						
	Kaukauna Lock 4		23.04						
	Kaukauna Lock 3		23.22						
9	Kaukauna-Fox River Valley RR bridge	Railroad	23.34		40		14		Swing. Right draw not available. Note 3.
	Kaukauna Lock 2		23.36						
10	Overhead cable	Power	23.55				80		
	Kaukauna Lock 1		23.57						
11	Kaukauna-Wisconsin Ave bridge	Highway	23.78			90	7		Vertical lift. Clearance up 65 feet. Note 3.
12	Kaukauna-Lawe Ave. bridge	Highway	23.89			90	23		Bascule. Note 3.
	Kaukauna Guard Lock		23.98						
	Combined Locks		25.40						
13	Overhead cable	Power	25.47				75		
14	Overhead cable	Power	25.81				70		
	Little Chute Lock 2		26.34						
	Little Chute Guard Lock		26.53						
15	Little Chute-Mill St. bridge	Highway	26.53			35	4		Bascule. Note 3.
16	Little Chute-Kimberly bridge	Highway	26.70			143	54		Fixed.
17	Overhead cable	Power	27.20				82		
	Cedars Lock		27.32						
18	Overhead cable	Power	27.91				99		
18A	Appleton-Tri-County Expressway	Highway	28.06			100	54		Fixed.
19	Overhead cable	Power	29.89				85		
	Appleton Lock 4		30.76						

Structures across Fox River from De Pere to Lake Butte des Morts
**miles above the mouth of the river*
***Clear width in feet proceeding upstream*

No.	Location and Name	Kind	Miles*	Clear width in feet of draw and span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Low	High	
20	Appleton-College Ave. bridge	Highway	30.80				54		Fixed.
21	Overhead cable	Power	31.21				73		
22	Appleton-Fox River Valley RR bridge	Railroad	31.22	60	59		4		Swing. Right draw not available. Note 3.
	Appleton Lock 3		31.31						
23	Overhead cable	Power	31.36				67		
24	Appleton-Lawe St. bridge	Highway	31.37			70	3		Bascule. Note 3.
	Appleton Lock 2		31.60						
25	Appleton-Oneida St. bridge	Highway	31.74			30	10		Bascule. Note 3.
25A	Appleton-Oneida Skyline bridge	Highway	31.85			70	54		Fixed.
	Appleton Lock 1		31.96						
26	Overhead cable	Power	32.01				83		
27	Appleton-Memorial Dr. bridge	Highway	32.36			132	54		Fixed.
28	Overhead cable	Power	34.36				64		
29	Overhead cables	Power	34.56				56		
30	Little Lake Butte des Morts bridge	Highway	35.94			217	54		Fixed. Navigation through E center span.
	Menasha Lock		37.05						
31	Overhead cables	Power & Television	37.27				64		
32	Menasha-Soo Line RR and Chicago, Milwaukee, St. Paul & Pacific RR bridge	Railroad	37.28	60			3		Bascule. Note 3.
33	Menasha-Tayco St. bridge	Highway	37.52			63	3		Bascule. Note 3.
34	Menasha-Racine St. bridge	Highway	37.91			101	3		Bascule. Note 3.
35	Overhead cable	Power	37.92				60		
36	Oshkosh-Fox River Valley RR bridge	Railroad	55.72	70	70		6		Swing. Note 3.
37	Oshkosh-Main St. bridge	Highway	55.97			89	11		Bascule. Note 2.
38	Oshkosh-Jackson St. bridge	Highway	56.22			97	11		Bascule. Note 2.
39	Overhead cable	Power	56.57				72		
40	Oshkosh-Wisconsin St. bridge	Highway	56.72			75	12		Bascule. Note 2.
41	Overhead cable	Power	57.24				75		
42	Oshkosh-Congress Ave. bridge	Highway	58.01			75	13		Bascule. Note 2.
43	Overhead cable	Power	59.22				78		
44	Oshkosh-US Route 41 bridge	Highway	59.24			76	31		Twin fixed.

Note 1.–See **33 CFR 117.1 through 117.59 and 117.1087(b)**, chapter 2, for drawbridge regulations.

Note 2.–See **33 CFR 117.1 through 117.59 and 117.1087(c)**, chapter 2, for drawbridge regulations.

Note 3.–See **33 CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Structures across the Wolf River
***Miles above the mouth of the river**
****Clear width in feet proceeding upstream**

No.	Location and Name	Kind	Miles*	Clear width in feet of draw or span openings**			Clear height in feet above Water Datum		Remarks
				Right	Left	Center	Standard low water	Extreme high water	
1	Overhead cable	Power	2.18				89	82	
2	Overhead cable	Power	2.37				75	68	
3	Winnecome bridge	Highway	2.43			70	7	2	Bascule. Note 1.
4	Overhead cable	Power	20.93				71	64	
5	Overhead cable	Power	22.38				82	75	
6	Fremont bridge	Highway	22.43			161	20	12	Fixed.
7	Overhead cable	Power	22.44				60	53	
8	Overhead cable	Power	27.70				68	60	
9	Gills Landing-Soo Line RR bridge	Railroad	27.83	56	56		9	0	Notes 2 and 3.
10	Overhead cable	Power	27.84				47	38	
11	Northport bridge	Highway	42.70			96	15	5	Fixed.
12	Overhead cable	Power	42.72				35	25	
13	Overhead cable	Power	42.74				68	58	
14	New London-Shawno St. bridge	Highway	46.13			62	15	3	Fixed.
15	Overhead cable	Power	46.37				67	55	
16	New London-Pearl St. bridge	Highway	46.43			100	15	3	Fixed.
17	Overhead cable	Power	46.63				58	46	

Note 1.–See **CFR 117.1 through 117.59 and 117.1107**, chapter 2, for drawbridge regulations.

Note 2.–See **CFR 117.1 through 117.49**, chapter 2, for drawbridge regulations.

Note 3.–Advance notice of 24 hours is required for bridge opening; telephone, 715-344-1910.

bottom. A marina on the W side of the bay provides berths, electricity, gasoline, and sewage pump-out.

(1011) **Duck Creek,** flowing into Green Bay 1.5 miles NW of the mouth of Fox River, is navigable by small craft for 2.7 miles above the mouth. The creek has depths of 1 to 3 feet through marshy areas near the mouth, thence 3 feet in the creek.

(1012) **Suamico River** is a small stream flowing into Green Bay about 6 miles N of the mouth of Fox River.

Channels

(1013) A dredged entrance channel leads from deep water in Green Bay to the mouth of the river and thence upstream for 0.15 mile. The entrance channel is marked by private lighted buoys. In July 2006, the controlling depth was 6 feet in the entrance channel and through the river to the head of the project (except for shoaling to 3 feet along the N side of the channel between Lighted Buoy 8 and the mouth of the river.)

(1014) A submerged discharge structure, marked by a buoy, is on the S side of the bend at the entrance to the river. Caution should be exercised in the area.

(1015) A fixed highway bridge with a clearance of 10 feet crosses the river about 1.5 miles above the mouth.

(1016) From Suamico River N for 14 miles to Pensaukee, the shore is bordered by shoals extending about 3 miles off. Depths of 2 feet are as much as 1.7 miles off. **Little Tail Point,** 3 miles N of Suamico River, is a narrow ridge, nearly level with the water surface, that extends about 1.8 miles SE from shore. **Little Suamico River** is a small stream 5 miles N of Suamico River.

Charts 14902, 14910

(1017) **Pensaukee Harbor** is at the mouth of **Pensaukee River,** on the W shore of Green Bay about 14 miles N of Suamico River.

Channels

(1018) A dredged entrance channel leads from deep water in Green Bay to the mouth of the river. A lighted buoy marks the dredged channel, and a light marks the pier ruins on the N side of the entrance channel. In June 2005, the centerline controlling depth was 3.8 feet to the mouth of the river.

(1019) The only facilities available at Pensaukee Harbor are for fish tugs which moor on the S side of the river mouth.

(1020) From Pensaukee Harbor NE for 6.5 miles to the mouth of Oconto River, shoals extend 3.8 miles from shore. **Pensaukee Shoal,** with depths of 1 to 4 feet, extends 3 miles SE from shore about 2 miles NE of Pensaukee Harbor. A wreck covered 4 feet is 4.2 miles ENE of the mouth of Pensaukee River. A shoal bank with depths of 1 to 5 feet extends 2.3 miles SE from shore just S of the mouth of Oconto River. **Oconto Shoal,** with a least depth of 11 feet, is a detached bank 3.6 miles SE of Oconto River mouth.

(1021) **Oconto Harbor** is at the mouth of **Oconto River,** on the W shore of Green Bay about 27 miles N of the mouth of Fox River. The city of **Oconto, Wis.,** is about 2 miles up the river. Below Oconto the river traverses an area of low, swampy ground, the elevation of which is only slightly above the surface of the river.

Channels

(1022) A dredged entrance channel leads from deep water in Green Bay between two piers to a turning basin inside the mouth of the river. The outer ends of the N and S piers are marked by lights. A stub about mid-length of the N pier juts out SE toward the channel; a buoy is near the outer end of the stub, marking the NW boundary of the channel. Just NE of the stub, the harbor channel decreases in width to the turning basin. In July 2006, the controlling depth was 2.9 feet in the entrance and between the piers to the turning basin, thence general depths of 6 to 8 feet were available in the basin. A spoil bank extends about 350 feet into the center of the turning basin from the SW end.

(1023) Inside the shoreward ends of the piers, the banks of the river are generally unprotected by revetments, and bars form in the wide portions of the channel from scour in the narrower parts during severe freshets. A depth of about 3 feet can be carried for 1 mile in the river with local knowledge.

(1024) A fixed highway bridge with a clearance of 9 feet crosses the river at Oconto.

Small-craft facilities

(1025) Marinas on the N side of the river provide transient berths, gasoline, water, electricity, sewage pump-out, limited marine supplies, and launching ramps. A 15-ton hoist is available for hull and engine repairs.

(1026) From the mouth of Oconto River, the shore trends N for about 3 miles and then curves E for about 9 miles to the mouth of **Peshtigo River.** The shore in this stretch is low and wooded, and the broad bight between the mouths of the two rivers is shallow, with prevailing depths of 1 to 12 feet. A detached shoal with a least depth of 17 feet is 6.5 miles E of the mouth of Oconto River. The approach to Peshtigo River is marked by a lighted bell buoy 0.9 mile S of the mouth.

(1027) **Peshtigo Point** is a low marshy point just E of the mouth of Peshtigo River. **Peshtigo Reef,** with depths of 1 to 6 feet, extends 3 miles SE from the point. **Peshtigo Reef Light** (44°57.4'N., 87°34.8'W.), 72 feet above the water, is shown from a white column with a red band at the outer end of the reef; a fog signal is at the light.

Charts 14902, 14910, 14909

(1028) From Peshtigo Point N for 8 miles to Menominee River, the shore is bordered by a sandy ledge that extends 2 miles offshore. In the S part of the reach, depths on the ledge are 5 to 10 feet, but in the N part of the reach, **Menekaunee Shoal** uncovers and is marked on the outer edge by a buoy. A wreck, covered 2 feet, 0.4 mile SE of Menominee Pierhead Light, is a hazard to small craft.

(1029) A private light marks the S side of the mouth of **Little River,** about 3.3 SSW of the mouth of Menominee River.

(1030) **Green Island** is a wooded island 5 miles SE of the mouth of Menominee River. Shoals extend about 0.2 mile off the N and S shores. A shoal that extends 0.7 mile SE from the E end of the island is marked off the outer end by a buoy, and a shoal with depths of 3 to 11 feet that extends W from the island is marked at the outer end by a lighted buoy. The area surrounding Green Island should be avoided by deep-draft vessels, because it is foul with stones and waste discharged from dredging operations. **Green Island Light** (45°03.3'N., 87°29.5'W.), 80 feet above the water, is

shown from a skeleton tower with a red and white diamond-shaped daymark on the SE end of the island. A dangerous wreck about 1.4 miles NNE of Green Island Light was reported in 1995.

Charts 14909, 14917

(1031) **Marinette, Wis.,** on the S side, and **Menominee, Mich.,** on the N side, form a deep-draft harbor at the mouth of **Menominee River.** The harbor is on the W side of Green Bay, about 33 miles SW of Porte des Morts Passage and 17 miles NW of the Sturgeon Bay Ship Canal. Menominee River forms the **State boundary** between Wisconsin and Michigan for about 150 miles from the mouth. The principal commodities handled in the harbor are coal, stone, sand, and salt.

Prominent features

(1032) Prominent are the easternmost stack on the N side of the river mouth, a radio tower 1.1 miles NW of the river mouth, and a yellow brick stack 2.3 miles NNW of the river mouth.

(1033) **Menominee Pierhead Light 4** (45°05.8'N., 87°35.2'W.), 46 feet above the water, is shown from a red octagonal tower on a square concrete base on the outer end of the N pier.

Channels

(1034) A dredged entrance channel leads SW from deep water in Green Bay between parallel piers at the mouth of Menominee River and thence upstream for about 1.7 miles to about 600 feet below the Dunlap Avenue bridge. A turning basin is on the S side of the channel about 1.2 miles above the mouth. The entrance channel is marked by buoys, and the outer ends of the piers and the inner end of the N pier are marked by lights.

(1035) In August 2006, the controlling depths were 21 feet in the entrance, between the piers, and in the river channel to about 0.2 mile above the turning basin with lesser depths to 19 feet along the edges of the channel (except for shoaling to 15.7 feet along the S edge of the channel near the end of the S pier, shoaling to 17.7 feet on the N side of the channel in about 45°05'44"N., 87°35'31"W., shoaling to 14.8 feet at the N side of the channel just above the Ogden Street bridge, and shoaling to 9.9 feet in the right outside quarter of the channel above the turning basin), thence 13 feet with gradual shoaling to 9 feet at the head of the project; the turning basin had depths of 17 to 21 feet with shoaling to 4 feet along the SE side.

(1036) Mariners are cautioned against navigating outside channel limits in the vicinity of structures protected by stone riprap.

(1037) Currents in the river attain velocities up to 3 mph.

(1038) Above the dredged channel, the river has depths of 1 to 5 feet and is obstructed by numerous rocks. A dam blocks the river 0.7 mile above the dredged channel.

Dangers

(1039) The entrance channel, lakeward of the piers, is bordered closely by shoals on either side. **Menominee Shoal,** a detached shoal with a least depth of 17 feet, is 0.8 mile NE of Menominee Pierhead Light and is marked on the E side by a lighted bell buoy. A 14-foot spot is 0.2 mile NE of the light.

Bridge

(1040) A bascule highway bridge with a clearance of 18 feet at the center crosses Menominee River about 0.7 mile above the pierheads. (See **33 CFR 117.1 through 117.59 and 117.1091,** chapter 2, for drawbridge regulations.)

Towage

(1041) Tugs for Menominee and Marinette are available from Sturgeon Bay and Green Bay. (See Towage under those ports.)

(1042) Marinette is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(1043) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(1044) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Harbor regulations

(1045) A **speed limit** of 4 mph (3.5 knots) is enforced in the harbor. (See **33 CFR 162.120,** chapter 2, for regulations.)

Wharves

(1046) There are three deep-draft facilities at Menominee and Marinette. The alongside depths given for these facilities are reported depths. (For information on the latest depths, contact the operators.)

(1047) **Menominee Paper Co. Dock:** N side of the river mouth; 550 feet of berthing space; 18 feet alongside; deck height, 6 feet; open storage for 60,000 tons of coal; receipt of coal for plant consumption; owned and operated by Menominee Paper Co.

(1048) **Marinette Fuel and Dock Co. Dock:** (45°05'42"N., 87°35'42"W.), S side of river mouth; 1,400-foot face, N side, and 700-foot face, S side; 22 feet

and 16 feet depth alongside, respectively; deck height, 2 feet; two 50-ton crawler cranes; open storage for 150,000 tons of coal; receipt of dry bulkhead commodities, including coal, pig iron, salt, limestone and lime; owned and operated by Marinette Fuel & Dock Co.

(1049) **Ansul Fire Protection, Coal Dock:** (45°05'42"N., 87°36'42"W.), S side of the river 1.5 miles above the pierheads; 600-foot face; 19 feet alongside; deck height, 8 feet; open storage for 8,000 tons of coal; receipt of coal by self unloading vessel; owned and operated by Ansul Fire Protection.

Repairs

(1050) Marinette Marine Corp., a shipbuilder on the S side of the river 1.7 miles above the pierheads, can make emergency above-the-waterline repairs. Two 100- and one 40-ton crawler cranes are available.

Small-craft facilities

(1051) A municipal marina developed by the city of Menominee and the Michigan State Waterways Commission is protected by breakwaters on the lakefront 1 mile NW of the river mouth and a private marina is on the S side of the river 2 miles above the pierheads. Transient berths, gasoline, diesel fuel, water, electricity, sewage pump-out, limited marine supplies, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A hoist for small sailboats and a 40-ton hoist that can handle craft to 65 feet long for hull and engine repairs are available.

Charts 14902, 14909

(1052) From Menominee River, the shore is low and wooded for 24.5 miles NNE to Cedar River. Shoals extend as much as 1.3 miles from shore, with depths of 8 to 12 feet near the outer edge. **Ingallston** and **Arthur Bay** are small fishing settlements about 8 and 16 miles N of Menominee River, respectively.

(1053) **Cedar River, Mich.,** is a small village at the mouth of **Cedar River,** across Green Bay W of Porte des Morts Passage. The mouth of the river is protected by E and W piers. The E pier is in ruins and mostly submerged. The approach to the river is marked by buoys, and the outer end of the pier is marked by a light. In September 2006, the controlling depth was 2.4 feet between the piers and upstream for 0.4 mile to the fixed highway bridge at the head of navigation. The bridge has a clearance of 10 feet. A marina on the E side of the river just below the highway bridge provides transient berths, gasoline, diesel fuel, biodiesel fuel, electricity, water, sewage pump-out, and launch ramp.

(1054) **Whaleback Shoal,** with a least depth of 3 feet, is in the middle of Green Bay, 8.5 miles E of Cedar River. The shoal is marked at the NW end by a buoy and at the SE end by a lighted bell buoy. The shoal is a hazard to vessels, especially in foul weather. A dangerous wreck in about 45°21'29.4"N., 087°10'57.7"W. was reported in 1995, on the NE side of the shoal.

Charts 14902, 14909, 14908

(1055) The shore is low and wooded from Cedar River NNE for 21 miles to Ford River. The shoal border in this stretch is irregular, and there are numerous submerged rocks. A 4-foot spot is 0.6 mile NE of **Deadmans Point,** 2 miles N of Cedar River. Just S of **Deer Creek,** 5.8 miles N of Cedar River, a shoal with two rocks covered about 1 foot near its outer end extends 0.7 mile from shore. A rock awash is 0.7 mile offshore 10 miles N of Cedar River.

Time

(1056) Areas generally S and W of Deer Creek observe central standard time or central daylight saving time. Michigan communities N of Deer Creek observe eastern standard time or eastern daylight saving time.

Charts 14908, 14915

(1057) **Little Bay de Noc** is the W arm of the N end of Green Bay. The bay is entered between **Fishery Point** on the W and Peninsula Point on the E. Very shallow ledges extend off both sides of the bay, but the natural channel up the middle of the bay has good deep water and permits the passage of the deeper draft vessels on the lakes.

(1058) **Ford River, Mich.,** is a small fishing village at the mouth of **Ford River** on the W side of the entrance to Little Bay de Noc.

(1059) From a point on shore about 4 miles SW of Ford River, a shoal bank extends about 6.5 miles E and thence N for about 7 miles to Sand Point at the city of Escanaba. The bank, forming the W limit of the deepwater channel into the bay, is marked on the SE side by a lighted buoy. Depths on the bank are 1 to 20 feet, but at the edge increase quickly to 50 feet and more in the channel.

(1060) A 24-foot spot, marked on the W side by a lighted buoy, is on the E side of the vessel route into the bay, 1.1 miles SE of Sand Point.

(1061) **Escanaba, Mich.,** is on the W side of Little Bay de Noc, 6 miles NE of Ford River and 7 miles NW of Peninsula Point. A lighted red brick cylindrical building in the city is prominent. **Sand Point,** marked by a

private light, extends E from shore at the city and protects the harbor area on its N side. The harbor has depths of 28 to 40 feet within 0.4 mile of shore and affords access for the largest vessels on the lakes. **Escanaba River** flows into the harbor 2.5 miles NW of Sand Point.

(1062) **Escanaba Light** (45°44.8'N., 87°02.2'W.), 45 feet above the water, is shown from a white square tower with a green stripe on a crib on the NE side of the shoal on the N side of Sand Point; a fog signal is at the light. A buoy 0.35 mile W of the light marks the N side of an obstruction.

Local magnetic disturbance

(1063) Differences from normal variation of up to 17° have been observed in the vicinity of Escanaba.

Caution

(1064) A submerged piling, covered 22 feet, is 0.3 mile SE of Chicago and North Western Transportation Co., Ore Dock No. 6.

Towage

(1065) Tugs are available from Sturgeon Bay. (See Towage under Sturgeon Bay.)

(1066) Escanaba is a **customs station.**

Quarantine, customs, immigration, and agricultural quarantine

(1067) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(1068) **Quarantine** is enforced in accordance with the regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

Wharves

(1069) Escanaba has several deep-draft facilities on the W side of the harbor N of Sand Point. (For complete information on the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) All the facilities described have highway connections and some have railway connections.

(1070) **The C. Reiss Coal Co., Dock No. 2:** 1 mile WNW of Escanaba Light; 1,900-foot face; 21 to 24 feet alongside; deck height, 7 feet: open storage for 120,000 tons of coal and 360,000 tons of limestone; receipt of coal and limestone; owned and operated by The C. Reiss Coal Co.

(1071) **Chicago and North Western Railway, Ore Dock No. 6:** 1.7 miles NW of Escanaba Light: 1,979-foot N and S faces; 28 to 31 feet alongside S face, 28 to 32 feet alongside N face; deck height, 2 feet at pilings increasing to 8 feet at top of dock fill; open storage for 2 million tons of material; one traveling ship loader, average rate, 4,000 tons per hour; shipment of iron ore and iron ore pellets; owned and operated by Chicago and North Western Railway.

(1072) **The C. Reiss Coal Co., Escanaba Dock No.1:** 2.1 miles NW of Escanaba Light, 1,050-foot face; 21 to 27 feet alongside; deck height, 5 feet; open storage for 125,000 tons of coal; receipt of coal; owned by The C. Reiss Coal Co. and operated by The C. Reiss Coal Co. and Upper Peninsula Power Co.

(1073) **Defense Fuel Supply Center, Escanaba Terminal Dock:** 1 mile N of the mouth of Escanaba River; offshore wharf, 435 feet of berthing space with dolphins; 28 feet alongside the face; deck height, 9 feet; tank storage for 640,000 barrels; receipt of petroleum products; owned by U.S. Government and operated by Continental Services Co., Inc.

Repairs

(1074) T.D. Vinette Co. makes emergency above-the-waterline repairs to vessels at their berths.

Small-craft facilities

(1075) A small-craft basin, developed by the city and the Michigan State Waterways Commission, is on the S side of Sand Point. A small island, connected to the mainland by a bridge at the W end, forms the S side of the basin. The entrance to the basin has depths of 9 feet, with 1 to 12 feet in the basin. A private light on Sand Point marks the N side of the entrance. Transient berths, gasoline, diesel fuel, water, ice, electricity, sewage pump-out facilities, launching ramp, and harbormaster services are available. The harbormaster monitors VHF-FM channels 16 and 9. A boatyard 0.5 mile S of Escanaba River has a 50-ton vertical boat lift and can make repairs to 80-foot vessels.

(1076) From Sand Point the shore extends N, then bends NE to Saunders Point at Gladstone. Very shallow water extends up to 0.6 mile from shore in this reach.

(1077) **Gladstone, Mich.,** is on the W side of Little Bay de Noc, 7 miles N of Escanaba. **Saunders Point,** marked by a light, extends E from shore at Gladstone and help protects the upper part of the bay on its SW side. The E part of the upper bay, just N of Gladstone, has depths of 23 to 30 feet, with shoaling to less than 10 feet in the W part. Buoys mark the E and N extent of shoals on the N side of Saunders Point.

(1078) Lighted radio masts in Gladstone form a range useful as a guide into Little Bay de Noc, except in the vicinity of Sand Point where the range brings vessels too close to the shoals.

Channels

(1079) A dredged channel leads from the deep water in Little Bay de Noc to a basin off the waterfront at Kipling, 1.5 miles N of Saunders Point. In 1990, the controlling depth was 22 feet in the channel and basin except for 20 feet along the E edge of the basin.

Anchorage

(1080) **Squaw Point**, marked by a lighted buoy, extends from the E side of Little Bay de Noc 1.2 miles S of Saunders Point. A deep channel leads between the points to the upper part of the bay. Good anchorage, with mud bottom, is in the upper bay above Saunders Point, just N of Gladstone.

Towage

(1081) Tugs are available from Sturgeon Bay. (See Towage under Sturgeon Bay.)

Wharves

(1082) Gladstone has two deep-draft facilities on the N side of Saunders Point. (For a complete description of the port facilities, refer to Port Series No. 48, published and sold by the U.S. Army Corps of Engineers. See Appendix A for address.) The alongside depths given for the facilities described are reported depths. (For information on the latest depths, contact the operators.) The facilities described have highway connections.

(1083) **Payne and Dolan, Inc., Escanaba Dock:** 0.3 mile NW of Saunders Point Light; 250 feet of berthing space with dolphins; 23 feet alongside; deck height, 5 feet; tank storage for 161,000 barrels; receipt of asphalt; owned and operated by Payne and Dolan, Inc.

(1084) **Upper Lakes Coal Co., Dock:** immediately W of Payne and Dolan, Inc. Dock; 910-foot face; 21 feet alongside; deck height, 10 feet; open storage for 328,000 tons of bulk material; receipt of limestone, coal, salt, and miscellaneous bulk materials; owned and operated by Upper Lakes Coal Co., Inc.

Small-craft facilities

(1085) A small-craft basin, developed by the city and the Michigan State Waterways Commission, is 1.2 miles SW of Saunders Point. The entrance to the basin, with a reported depth of 7 feet in 1999, is protected on the SW side by a pier and detached breakwater. The E end of the breakwater is marked by a private light and the entrance channel is marked by buoys. The basin has reported depths of 4 to 8 feet. A municipal marina in the basin offers: gasoline, diesel fuel, water, ice, electricity, sewage pump-out, transient berths, marine supplies, launching ramp and harbormaster services. The **harbormaster** monitors VHF-FM channels 16 and 9. A 3-ton hoist is also available for engine and minor hull repairs. Another public launching ramp is about 1.4 miles NW of Saunders Point Light on the shore W of Butlers Island.

(1086) **Tacoosh River, Rapid River,** and **Whitefish River** flow into the N end of Little Bay de Noc through a common mouth between spits of land that extend from the E and W shores of the bay. An undefined, narrow, and tortuous channel through the mouth had a controlling depth of 3 feet in 1965.

(1087) Shoals extend about 1 mile from the head of Little Bay de Noc. From the head of the bay to Squaw Point, depths of 1 to 3 feet extend about 0.3 mile off the E shore. Below Squaw Point, the shoal border increases to a width of over 2 miles and is marked on the W side by a lighted buoy 5.1 miles S of Squaw Point opposite the village of **Stonington, Mich.** The shore in the vicinity of Stonington is bluff. Below Stonington the shoal border decreases from 0.5 mile wide to about 0.2 mile wide at **Dutchman Point,** 4 miles S. From Dutchman Point to Peninsula Point, the shore should be given a berth of 0.8 mile.

(1088) **Peninsula Point** (45°40.1'N., 86°58.0'W.) is the S point of the peninsula that separates Little Bay de Noc and Big Bay de Noc at the N end of Green Bay. **Peninsula Point Shoal,** a rocky ledge with depths of 1 to 6 feet, extends 1.1 miles S from the point. Depths less than 18 feet extend 1 mile farther S, and detached shoals reach about 8 miles S of Peninsula Point. **Eleven Foot Shoal,** with a least depth of 5 feet, is 2.2 miles S of the point. A lighted bell buoy is off the W side of the shoal. **Corona Shoal,** with a least depth of 12 feet, is 3.4 miles S of Peninsula Point. A buoy is 1.3 miles W of the shoal, on the E side of the vessel route into Little Bay de Noc.

Charts 14908, 14909

(1089) **Minneapolis Shoal**, with a least depth of 15 feet, is 6.2 miles S of Peninsula Point. **Minneapolis Shoal Light** (45°34.9'N., 86°59.9'W.), 82 feet above the water, is shown from a square cream-colored tower on a concrete base on the shoal; a fog signal is at the light. The light should be given a berth of at least 0.25 mile. **Drisco Shoal,** with a least depth of 9 feet, is 2.4 miles SE of Minneapolis Shoal Light and is marked at the S end by a lighted buoy. **North Drisco Shoal,** a boulder bank covered 17 feet, is 1.5 miles ESE of Minneapolis Shoal Light. Several 21- to 24-foot spots are in the vicinity. These shoals lie close to the track of vessels bound from Rock Island and Porte des Morts Passages to Little Bay de Noc.

Chart 14908

(1090) **Big Bay de Noc** is the NE arm of Green Bay, between Peninsula Point on the W and Garden Peninsula on the E. Numerous submerged net stakes are throughout the bay.

(1091) From Peninsula Point, the shore is low and wooded for 7.2 miles NE to **Chippewa Point.** Shoals extend from about 1 to 2 miles offshore. From Chippewa Point NNE for 6 miles to **St. Vital Point,** numerous rocks awash are within 1.1 miles of shore. **Round Island,** 4 miles ENE of Chippewa Point, is surrounded by shoals, 0.7 mile to N and 0.5 mile to S. A shoal with least depths of 2 feet is 0.9 mile NW of Round Island, 1.7 miles from the adjacent mainland shore. **Ripley Shoal,** with a least depth of 1 foot, is 1.3 miles N of Round Island. **St. Vital Island,** 1 mile E of St. Vital Point, is connected to it by a shallow bank with depths of 1 to 4 feet and rocks awash.

(1092) **Ogontz Bay** is a shallow bight on the NW side of Big Bay de Noc between St. Vital Point on the W and **Indian Point** on the E. Between Indian Point and **Stony Point,** 3.5 miles E, **Big Bay de Noc Shoal** extends 6.6 miles S into the center of Big Bay de Noc. The bank has depths of 3 to 7 feet at the S end and is marked at the S end by a buoy.

(1093) **Nahma, Mich.,** is a small village on the shore W of Stony Point and at the mouth of **Sturgeon River.** It contains the mills and docks of the American Playground Device Co. Three dilapidated docks extend about 450 feet into the bay, and E therefrom are the ruins of four other docks. There is a reported depth of about 12 feet between the docks, but they should be approached with extreme caution. The water is shoal on the W side of the W dock and on the E side of the E dock.

(1094) From Stony Point, the NE part of Big Bay de Noc extends NE for 3.8 miles to **Porcupine Point,** thence curves around through N to **Valentine Point** on the E side, thence extends SSW for 4.1 miles to **Ansels Point.** This part of the bay has central depths of 15 to 22 feet with gradual shoaling toward the shores. **Garden Bay,** on the S side of Ansels Point, has available depths of 8 to 12 feet and affords anchorage with protection from all but SW to NW winds. Between **Garden Bluff,** on the S side of Garden Bay, and **Middle Bluff,** white in color and 4 miles SSW, the shore is indented by a shallow bay. **Snake Island** is in the S end of the mouth of this bay, just N of Middle Bluff.

(1095) **Snail Shell Harbor,** a small cove just S of Middle Bluff, provides excellent protection for recreational craft. The entrance to the harbor is marked by a lighted bell buoy. In 1978, depths of 20 feet were reported in the entrance, with 10 feet along the W shore and 6 feet along the S shore. A Michigan State Waterways Commission dock with transient berths is in the cove. **Fayette, Mich.,** is a town at the head of the cove.

(1096) **Sand Bay,** the broad bight just S of Snail Shell Harbor, has deep water within 0.3 mile of shore. **Burnt Bluff,** on the S side of Sand Bay, is deep-to, and this trend continues S for 3 miles to the W point of Sac Bay. A small private artificial small-craft basin is on the W side of Burnt Bluff. Transient berths, water, and electricity are available.

(1097) **Sac Bay,** a small indentation in the SW end of Garden Peninsula, provides anchorage with protection from all but SE to W winds.

(1098) **Fairport, Mich.,** a small fishing settlement midway between Sac Bay and Point Detour, has several landings with depths of 5 to 6 feet at their outer ends. A sandy and stony flat connects the mainland shore at Fairport with the Summer Islands to the S. A narrow 6-foot channel leads across the flat, following close to the mainland shore. The channel is obstructed by a 1-foot spot, marked on the NW side by a buoy.

(1099) **Point Detour** (45°36.1'N., 86°36.7'W.), the S extremity of Garden Peninsula, is the N entrance point to Green Bay. The islands and passages S of the point were described previously.

(1100) Between Point Detour and Point aux Barques, 18 miles NE, the E shore of Garden Peninsula is broken by a series of bays and inlets opening to the E and S. Shoals extend about 0.8 mile S from Point Detour. A detached 16-foot shoal is 3.3 miles E of the first point N of Point Detour. From Point Detour to **Portage Bay,** 10 miles NE, the shore should be given a berth of 1 mile. Between Portage Bay and **Parent Bay,** 15 miles NE of Point Detour, rocks awash and shoals covered 1 to 6 feet extend as much as 2 miles offshore. Shoals extend over 1 mile SE from each side of the entrance to Parent Bay. Between the shoals, deep water extends to within 0.4 mile of the head of the bay. From Parent Bay E to Point aux Barques, shoals and rocks awash extend 1 mile from the bluff shore. At **Point aux Barques** (45°48.0'N., 86°21.0'W.) a shoal extends SE about 1.5 miles. In August 1982, a rock covered 5 feet was reported at the outer end of the shoal in about 45°47'08"N., 86°19'48"W.

(1101) From Point aux Barques, the low sandy shore trends N and then NE for about 12 miles to Manistique Harbor. In this stretch, shoals extend about 0.5 to 1 mile offshore, except at **Wiggins Point,** 4 miles N of Point aux Barques. **Wiggins Point Shoal,** with prevailing depths of 2 to 13 feet and rocks awash, extends about 2 miles offshore around the point. A lighted bell buoy marks the outer edge of the shoal.

(1102) **Manistique Harbor,** serving the town of **Manistique, Mich.,** is at the mouth of **Manistique River** on the N shore of Lake Michigan 73 miles W of the

Straits of Mackinac. A stack 0.9 mile NNW of the river mouth and a silver tank 0.8 mile NNE of the river mouth are prominent.

(1103) **Manistique Light** (45°56'42"N., 86°14'48"W.), 50 feet above the water, is shown from a tower on the outer end of the E breakwater; a fog signal is at the light.

Channels

(1104) The dredged entrance channel leads NE from deep water in Lake Michigan between converging breakwaters through an outer basin to the mouth of the Manistique River. The W side of the river entrance is protected by a pier. The outer ends of the breakwaters and the W pier are marked by lights. In August 2006, the controlling depth was 3.3 feet in the entrance and though the outer basin to the head of the project.

(1105) The channel and basin are not adapted for anchorage, and mooring to the breakwaters and pier is prohibited.

(1106) The current in the channel attains velocities up to 3 mph.

(1107) Above the dredged channel, there are a number of abandoned wharves with channels between having depths of about 7 feet.

Caution

(1108) Several shoals should be avoided by vessels approaching Manistique Harbor. A 23-foot spot is 3.1 miles S of Manistique Light. A rocky ledge, covered 18 feet, is 0.8 mile SSW of the light. Rock ledges, covered 8 to 17 feet, extend 0.4 mile S from the outer end of the E breakwater and 0.3 mile SW from the outer end of the W breakwater.

Small-craft facilities

(1109) A small-craft basin developed by the town and the Michigan State Waterways Commission is on the E side of the river 0.3 mile above the mouth. Transient berths, gasoline, water, ice, electricity, launching ramps, and sewage pump-out facilities are available.

(1110) From Manistique Harbor E for 4.5 miles to **Dutch Johns Point,** shoals extend 0.3 to 1.2 miles offshore. A detached 16-foot spot is 2 miles SE of the point, and detached 19-foot spots are 1.7 and 2.3 miles S of the point. These shoals should be avoided when approaching Manistique Harbor.

Chart 14911

(1111) About 2.5 miles E of Dutch Johns Point, the shoal border decreases to 0.3 mile wide for about 9.5 miles ESE to Seul Choix Point. **Seul Choix Point Light** (45°55.3'N., 85°54.7'W.), 80 feet above the water, is shown from a white conical tower connected to a red dwelling on **Seul Choix Point.**

(1112) A bay that opens between Seul Choix Point and **Hughes Point,** 4.5 miles NE, is protected from the N and W and has deep water within 0.8 mile of shore. A detached shoal with a least depth of 9 feet is 0.9 mile S of Hughes Point.

(1113) **Port Inland** is a private harbor of the Inland Lime & Stone Co., built on the lake in front of the company's plant about 4 miles NE of Seul Choix Point.

(1114) The harbor basin is protected by a breakwater, marked at the outer end by a private light with a fog signal, that extends S and W from shore. The privately dredged entrance channel has reported depths of about 30 feet and is marked by a private **000°** lighted range. A private **047°** lighted range marks the channel through the harbor basin.

(1115) Limestone is shipped from a 900-foot wharf on the NW side of the basin. The wharf has a deck height of 9 feet and reported depths of 25 feet alongside. There is open storage for 200,000 tons of limestone.

(1116) From Hughes Point, the shore trends E for 7 miles to **Scott Point** and thence 2 miles to **Point Patterson** (45°58.1'N., 85°39.3'W.). This stretch is filled with shoals and rocks extending 0.5 to 1 mile offshore.

(1117) From Point Patterson, the shore extends NE for 11 miles, thence E for 3.5 miles to **Millecoquins Point** (46°05.2'N., 85°26.8'W.). NE of Point Patterson the shoal border increases to a width of 2.8 miles and thence decreases to about 0.4 mile in the bight W of Millecoquins Point. Numerous submerged net stakes are within about 5 miles of shore in this stretch. **Cranberry Shoal,** with rocks awash, is 1.7 miles offshore 5.7 miles NE of Point Patterson. A detached 11-foot shoal is 1.3 miles WSW of Millecoquins Point, and a rock awash is 0.3 mile offshore 1 mile W of the point.

(1118) **Naubinway Island,** about 0.8 mile S of Millecoquins Point and marked by a light, is a small island surrounded by rocks and shoals. A 1-foot spot is 0.6 mile E of the island, and a detached 14-foot shoal is 0.8 mile SW of the island. **Naubinway Reef,** a rocky ledge with a least depth of 4 feet, is 1.5 miles SE of Naubinway Island. A detached 14-foot spot is midway between the reef and island.

(1119) **Potter Reef,** with a least depth of 1 foot and marked on the NE side by a buoy, is 7.3 miles SSW of Millecoquins Point and 6.5 miles ENE of Point Patterson. **Millecoquins Reefs** is a group of detached 7- to 13-foot spots that extend over 2 miles NW and SE, about 5 miles S of Millecoquins Point. A buoy marks the W end of the reefs. A number of detached shoal

spots are within 3.5 miles S of Millecoquins Reefs. The shoalest are a boulder covered 9 feet 1.4 miles SE, 12-foot spots 2.2 and 3 miles S, and a 14-foot spot 1.3 miles SW. These reefs and shoals are out of the normal vessel routes and are unmarked.

(1120) Lansing Shoals, Fagan Reef, Simmons Reef, and other shoals farther S in the vicinity of Beaver Island are described earlier in the chapter.

(1121) Between Millecoquins Point and **Biddle Point,** 3.3 miles E, a small bay has general depths of 12 feet or more with shoals within 0.4 mile of shore. On the W side of the bay, 2- and 7-foot spots are 0.6 mile ENE and E of Millecoquins Point, respectively.

(1122) **Naubinway, Mich.,** is a village on the W side of the bay, just N of Millecoquins Point. A former lumber dock on the N side of the point has washed out except for a few piles. Good shelter for craft drawing up to 10 feet is behind the small point just NE of Millecoquins Point, but the approach is rendered dangerous by the shoals E of Millecoquins Point. A small-craft harbor developed by the Michigan State Waterways Commission on the NE side of Millecoquins Point is protected by a breakwater. Transient berths, water, electricity, and a launching ramp are available.

(1123) From Biddle Point E for 9 miles to **Point Epoufette** (46°02.8'N., 85°11.7'W.), the shore is irregular and rocks and shoals extend 3 miles offshore in the bight just E of Biddle Point decreasing to 1 mile offshore just W of Point Epoufette. **Pelkie Reef,** with a depth of 11 feet at the N end and a rock awash at the S end, is 1.7 miles offshore 2.7 miles SW of Point Epoufette. A detached boulder ledge, covered 6 feet, is 1.5 miles WSW of Pelkie Reef. A 14-foot spot is 3 miles W of Pelkie Reef. Detached 16- and 17-foot spots are 1.1 miles SSW and 0.9 mile S of Point Epoufette, respectively.

Charts 14880, 14911, 14881

(1124) From Point Epoufette, the shore bends SE for 17 miles to **Point aux Chenes** (45°55.5'N., 84°54.6'W.). The shoal border reaches an extent of 1.8 miles about 4 miles E of Point Epoufette, thence decreases to 0.2 mile wide 3 miles N of Point aux Chenes. At Point aux Chenes, shoals and boulders, covered less than 18 feet, reach 1.5 miles W and 2.5 miles NW.

(1125) About 4.5 miles SE of Point Epoufette, a privately dredged channel, with a controlling depth of 24 feet in 1978, leads from deep water in Lake Michigan E to a private harbor of Sand Products Corp.

(1126) **Manitou Paymen Shoal,** with depths of 1 to 10 feet and a dangerous rock awash at the center, is 4 miles offshore, 8 miles SE of Point Epoufette. A buoy marks the S side of the shoal. A boulder, covered 18 feet, is 0.9 mile SSE of the buoy.

(1127) Between Point aux Chenes and **Gros Cap,** 5.7 miles SE, the shore is indented by small bays with shallow depths and rocks, awash and submerged. A boulder ledge, with a least depth of 17 feet, is 2.2 miles S of Point aux Chenes. **West Moran Bay,** on the SE side of Gros Cap, affords protection for small craft from N to E winds.

(1128) **St. Helena Island,** 2 miles SW of Gros Cap, is marked by a light on the SE end. Shoals extend about 0.3 mile off the NW, SW, and SE sides of the island. A buoy marks the SE edge of the shoals. Approaching from the W, the island should be given a wide berth.

(1129) **St. Helena Shoal,** 2 miles W of St. Helena Island, is 1.3 miles long E and W and has a least depth of 4 feet. A buoy marks the SW side of the shoal. Do not attempt to round the NW end of St. Helena Island at night unless its appearance under Gros Cap and the position of St. Helena Shoal are well understood.

(1130) From West Moran Bay SE for 2.5 miles to Point La Barbe, shoals extend about 1 mile offshore. **Point La Barbe** is the SW point of Point St. Ignace, which forms the S side of the Straits of Mackinac. **Green Island** and several small islets are on the shoal bank off Point La Barbe.

(1131) **Mackinac Bridge** crosses the Straits of Mackinac between Point St. Ignace on the N and Mackinaw City on the S. The center span of the suspension bridge has a clearance of 148 feet at the center decreasing to 135 feet at each end. The approaches to the bridge are marked by lighted and unlighted buoys. A private fog signal is under the main bridge span on the channel line. (Mackinac Bridge is described more completely at the beginning of this chapter.)

Currents

(1132) Currents in the Straits of Mackinac, particularly NE of Mackinac Bridge in the vicinity of the Graham Shoals, are often strong and irregular.

(1133) The Straits of Mackinac E of Mackinac Bridge are described in chapter 10.